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R.U.S.I. GOLD MEDAL PRIZE ESSAY.

Subject :—

"WHAT SHOULD BE THE DISPOSITION OF THE MATÉRIEL AND PERSONNEL OF THE BRITISH NAVY IN TIME OF PEACE, AND HOW CAN THE PEACE STRENGTH BE MOST RAPIDLY EXPANDED TO WAR STRENGTH?"

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"*Maris Imperium Salus Imperii.*"

THE answer to the first part of the subject set for discussion, "What should be the disposition of the *matériel* and *personnel* of the British Navy in time of Peace," must depend upon the best distribution of the Navy for war. And before we can answer the second part, "How can the Peace Strength be most rapidly expanded to War Strength?" we must enquire how much of the war strength we can afford to keep on a peace footing. If we may judge from past experience, war when it does come will almost certainly be unexpected, and, even if there is warning, it will be impossible to mobilise beforehand without precipitating the very evil we wish to avoid. The peace distribution must, therefore, depend entirely on war requirements.

It must at once be conceded that the actual position of each ship, whether battle ship, cruiser, or auxiliary, must be decided by the Admiralty. The Government alone are in a position to know the chances and risks of a collision with other Powers. The Admiralty alone know with any accuracy the strength and state of preparedness of those Powers.

It is for them therefore to decide with the full knowledge they possess what is the strategy to be adopted in the event of war, and consequently the distribution of the Navy during peace. The building programmes of the various naval Powers show that they are not content to allow us to have the undisputed command of the sea, and one of them, Germany, has definitely said so. The desire for sea power on the part of other nations is a factor to be reckoned with, for with the exception of the United States and Japan they have no need of this for purposes of defence. Without any very clear reasoning and apparently almost as an instinct of self-preservation, it is taken as an axiom that we must be strong enough at sea to meet successfully the two next strongest European Powers combined. But that this idea may have to be abandoned seems highly probable, when the rapid growth of the German and other Navies is taken into consideration. If we compare the strength of the British Navy with that of the Navies of other nations, we shall see at once that the task before the Admiralty now is not a light one.

In 1889, an official commission of three admirals considered that the standard of comparative strength of the British and a hostile force should be five battle-ships to three. For each battle-ship it is generally considered there should be one scout, while the writer of the Prize Essay in 1897, on the Protection of Commerce, estimated that this duty would require approximately 160 cruisers and torpedo-gunboats, besides about 90 each destroyers and torpedo-boats. It is doubtful if the duties assigned to destroyers in that essay could in many cases be carried out by such craft, and it is probable that another 20 cruisers would have to added on this account, to enable his views to be carried out.

The Admiralty Return for 1901 gives the battle-ships of the two next strongest European Powers, France and Russia, as 43. On the foregoing basis we should therefore require 72 battle-ships and 250 cruisers and torpedo-vessels. Towards this ideal fleet the Admiralty list provides us with 50 battle-ships (including 4 broadside ships over 30 years old, and 7 others from 20 to 30 years old, armed with muzzle-loading guns), and 158 cruisers and torpedo-vessels.

No later principle than the above being public property, and this being clearly quite impossible to comply with, we must endeavour to station our fleet so as to give it the best chance of success with the force at our disposal.

In attempting a practical distribution of the British Fleet, it is assumed that the fleets at the disposal of the various Powers are those specified as "built" in the Admiralty Return of 28th March, 1901. The stations of foreign ships are in some cases ascertainable, in others no information can be found in the Press. A situation approaching the actual facts is therefore all that can be attempted, and in the tables

giving a suggested distribution for the British Fleet, in accordance with the principles advanced, it must be taken that this is entirely dependent on the distribution of the opposing fleets being as assumed. However incorrect the assumed positions may be, the arguments will not be affected.

Duty of the Navy in War.

Before we can lay down any general principles on the subject before us, we must in the first place decide what are the duties of the Navy in war. The general expression to denote these duties is that we must have the "command of the sea." Our colonies and possessions, which lie in every part of the world, are an integral part of the Empire. In these respects we differ immensely from any other nation. The colonial possessions of other Powers are merely undeveloped properties—they can be parted with or exchanged without any real damage to their owners. The ideals are utterly different in the two cases. With us a colony is a part of the Empire in a more or less developed state. With other nations it is to a very large extent merely a district which can be traded with on the best terms for its owners, a market for surplus manufactures. The inhabitants, apart from officials, are the natives of the country and are not a part of the nation itself.

With us, the mercantile marine is the only means of communication between the various parts of the Empire. The trade routes are our railways and military roads. If in war the ships of any other nation are compelled to remain in their own ports, that nation would suffer scarcely at all, she may lose some or all of her oversea possessions without being very much affected. But if our ships are driven from the seas, the Empire must fall to pieces for want of communication between its parts. For the British Empire, therefore, the "command of the sea" is not merely an expression, it is an absolute necessity. Unless it is ours without question, the Empire is dismembered. The sea is really as much a part of the Empire as any of the lands claiming to be so, and the protection of this part of the Empire must fall on the Navy. We see then that the boundaries we have to defend must be wide enough to include the trade routes and cannot be confined to our own coast lines, or, as it has been put, our frontier is the enemy's coast.

This implies rapid, energetic, and offensive strategy for the fleets, and in order that they may be able to take full advantage of the nearest ports of the Empire to their theatre of action there must be one or more naval bases in each of the great divisions of the sea. These naval bases, whether primary or secondary, must be strongly held, for on them the fleets depend for coal, ammunition, supplies, and repairs, but at present no very clear line is drawn as to where naval responsibility ceases and that of the Army begins in their defence.

In a war in which we had to put forth all our energies, the command of the sea must first be assured to us; until it is so assured, the Army must act on the defensive. We cannot think of attacking the enemy on his own soil unless the seas are clear and our communications secure.

To attain this, the Navy must be free and the whole of its fighting force must be available. If this force is frittered away in defending harbours and coasts, the Navy will be hampered and tied, and cannot act in the best manner. The local defence of our coasts and ports, even of our great naval ports and coaling stations, should therefore not in any way depend on the Navy. Other nations, to whom the command of the sea is not a vital question, can leave the defence of these bases primarily to their Navies, but for us to do so would be to reduce our fleets to impotence. If the Navy were strong enough at sea the coasts would not require fortifying except against raiders, and it should be clearly laid down that the Navy is not responsible in any way for the defence even of its own ports and coaling stations. The "three-mile limit" might well be taken as the dividing line between the naval and military responsibility for defence, and it should be definitely stated that no man or vessel under the Admiralty could be counted upon to assist in the defence of any port they might happen to be in.

The risks incurred by the fleet in leaving the defence of the naval ports to soldiers are doubtless great. The latter cannot be expected to recognise by her appearance whether an approaching ship is friend or foe, and instances have constantly occurred at manœuvres of friendly ships having been theoretically sunk by the forts which should have protected them. But the same thing has occurred in the Navy itself with regard to torpedo-boats, and it would be better to face this risk rather than to lock up seamen in harbour or to use any part of the fleet as a stationary defence.

Such a dividing line would at once make clear to everyone what the duties of the fleet really are, and would remove such mistaken ideas as that the Channel and Reserve Squadrons are for the defence of the Channel and home waters respectively. These ideas, which constantly appear in the Press, are stated as if the function of these squadrons was literally to repel invasion, whereas their duties are really to prevent the enemy entertaining such an idea. It would also prevent such proposals as those which the Secretary of State for War lately brought forward being even thought of. To turn over the defence of the coaling stations to the Navy shows a misconception of the latter's duties which must lead to confusion in war. The above will answer the arguments of those who consider that the defence of the coasts should be left to the Admiralty. To form a third force for this purpose, as has been sometimes suggested, would be merely to add to the present confusion.

It will be taken then that the functions of the Navy in war are two, and two only: (1) The destruction or containing of the enemy's fleet; and, (2) The protection of commerce; and that it is no part of their duty to assist the Army either in the defence of the coasts or in attack, at least in the earlier stages of a war, which is all that we are concerned with here.

Probable Opponents.

We must now proceed to enquire as to whom we must be prepared to fight. In the first place, it is evident that we have not a sufficient force at our disposal to meet everyone at the same time, and that such a contingency is very remote. It is unlikely that the United States would join with all the European Powers against us, and it can hardly be to the interest of Japan, the only other extra-European Power with a modern fleet of any strength, to do so either. It may, therefore, be taken that we need not weaken ourselves by detaching battle-ships to these stations under normal conditions, unless some of the European Powers should have done so. Again, we may ignore the smaller European Powers whose fleets are more suitable for the purpose of defence. They are unlikely to be found all on the same side, and even if they were our margin of strength should be sufficient to prevent them turning the scale against us. There remain then the great European Powers, who are divided into the Dual Alliance (France and Russia) and the Triple Alliance (Germany, Austria, and Italy). If these two groups were to join against us, we should be over-matched, and could hardly by ourselves retain the command of the sea. What chance there is of such a combination is a question for statesmen, and, as no Government has thought it worth while to provide against it, we may assume either that they consider the chance a very remote one, or that they feel assured we shall receive help in such an eventuality from extra-European Powers. We will therefore dismiss this idea as one with which we need not concern ourselves, but it may be remarked that alliances are not for all time, and that a fresh grouping of the Powers may take place more quickly than we can build battle-ships or train crews to man them. Whether it is wise to stake the existence of the Empire on such arguments may well be doubted, but we are here concerned only with the Navy as it exists, and we must, therefore, take it that, in the event of war, we shall have to meet either the Dual or the Triple Alliance, the other maintaining neutrality.

Strategical Considerations.

The sea power of both these alliances is formidable, but strategically the situation is much the same in either case. A strong force in the

Mediterranean, a somewhat weaker force in the Channel, North Sea, or Baltic. The disposition of our ships to cope with one group would therefore almost serve for the other; but that the Dual Alliance having war-ships on other stations, notably in the East, we must detach certain ships of somewhat greater power to the same quarter of the globe to deal with them.

Strategically, we occupy the interior position between the divisions of the enemy's fleet. These divisions may of course act independently, but it is more probable they will try to combine. This involves one or more divisions passing through the Straits of Gibraltar, and it is doubtless this which causes it to be regarded as the first move on our part to concentrate the Mediterranean and Channel Squadrons there. This proceeding involves a certain risk, because if the enemy's northern divisions, instead of proceeding at once to Gibraltar, were to concentrate in the Channel, we should have to oppose them there only a fleet made up of ships which were not of the first class, and which had been hastily brought together. Our defeat there would leave the Channel in a dangerously open state. On the other hand, it is imperative that the divisions of the enemy's fleet should not be allowed to combine before our separate squadrons, watching each division, can also join hands, and also that our squadrons should each be strong enough to defeat the divisions they are opposed to. We, therefore, require a squadron in the Mediterranean to oppose either the French and Russians, or the Italians and Austrians; another in or near the Channel to oppose the French Northern Squadron or the German Fleet, and, in a war with the Dual Alliance, a third squadron in the North Sea to oppose the Russian Baltic Squadron. The naval power of the Dual Alliance being the stronger, it will be sufficient to consider them principally; a very slight alteration, if any, would be required to the dispositions made for the purpose of meeting France and Russia to adapt them to meet the Triple Alliance, and we may, therefore, station our ships with a view to a war with France and Russia.

Distribution of Duties.

At present the responsibility for keeping open the trade routes in the respective stations is considered a part of the duties of the admirals in command. This system allots to each admiral a certain number of cruisers for the duty both of scouting for his battle-ships and protecting the commerce on his station, and it is left to him to apportion them as he thinks best. If he has a sufficient supply of cruisers for both purposes, all no doubt will be well; but if, as history teaches us to expect, and as most naval officers believe, we shall be short of cruisers when war comes, then one duty or the other will suffer, either the battle-ships will

be short of scouts or the trade routes will be insufficiently protected. Which is the more likely to happen we may gather from the last manœuvres, where the attack on commerce was entrusted to torpedo-boat destroyers and the defence not attempted. This duty of protecting commerce cannot be neglected. The mere outbreak of war will cause the price of bread to rise before even a single ship is captured. A few ships are certain, even under the best arrangements, to be lost at first; and unless confidence can be quickly restored, the results may easily be serious. A large part of the population of London and other big towns live from hand to mouth with very little, if any, margin for contingencies. A rise in prices must affect them enormously, and disturbances are certain to occur if they have any idea that this rise is likely to be maintained. If this duty of protecting commerce is left to several different heads, as at present, different systems will be adopted, which, though they may each be good for one particular station, will not necessarily be the best for the object treated as a whole, and there will undoubtedly be overlapping, which the state of the Navy cannot afford.

Again, it will be necessary in some cases to follow a commerce-destroyer from one station to another, and if no special ship is definitely allotted for this purpose an admiral in command of a station may well hesitate to send one of his strongest cruisers off his station when by so doing he would be weakening his fighting squadron. He would naturally feel that he had done enough in driving the enemy off the trade route he was responsible for, and that it was the duty of the adjoining station to take up the hunt. The duties of scouts and commerce-protectors are entirely distinct and should be kept so. The former are only required to capture other ships for the sake of obtaining information for their own fleet or of preventing information reaching the enemy. Their objects are the same as those of cavalry screens and patrols. Commerce-protectors, on the other hand, have a different mission, and should not be required to deviate from it to carry information to the fleet. They must attack their opponents and disable them at whatever cost to themselves. Their rôle is that of a mobile column hunting down guerilla bands.

From these arguments it would seem that it would be of advantage if the commander-in-chief on the stations where we have battle fleets were relieved of this duty of protecting commerce, and if it were attended to by a separate head at the Admiralty. The admirals in command of battle fleets must, of course, provide for their own communications with their base, but their duties in this line should end there, and it should be the duty of the admiral in charge of trade routes to see that the supplies are safely taken to the base. This system would give a freer hand to the admirals in command of fleets watching the enemy's fighting squadrons, and they would not be expected to

make their cruisers do double duty. Both scouting and protecting commerce are of the greatest importance, but the training for, and the requirements of, each are different. By separating the ships and commands in this way, both can be fully attended to.

Distribution of the Fleet for War.

From the above it will be seen that we require three permanent battle squadrons, while at present we also have a fourth, possibly temporary, squadron in China. We should next enquire what the object of these squadrons should be and what should be their strength. In war the stronger Power may either blockade the enemy's fleet, or may contain it by stationing its fleet in a position where the enemy must pass so as to ensure an action, should the enemy come out of harbour. For the former purpose it has been laid down that the number of blockading ships must be at least one-third more than those of the enemy, so as to allow for a circulation of ships to the base for coaling, etc. If the base is a considerable distance off, as Malta or Gibraltar from Toulon, an even larger proportion may be required. Now a glance at the lists of ships in the tables attached will at once show that we have not got the large number of ships required for this purpose, and that, therefore, the close blockade of the old wars would not be possible for us. Moreover, the conditions are changed, and it is doubtful if such tactics would be the best. So much depends on coal, that a fleet with full coal supply, chased by one with bunkers in various stages of depletion would have its chances of escape enormously increased. If, therefore, a base, whether permanent or temporary, can be found for the containing fleet, in such a position as to ensure catching the enemy should he leave harbour, this is clearly the system which will have to be adopted. In our case there is no choice, we are compelled to take this course and so apportion our battle-ships between the various squadrons as to leave us in each with a slight preponderance in our favour.

A possible course of action for the enemy's fleet has been suggested above, but it may be that knowing our difficulty in enforcing a blockade, and the distances of our bases in the Mediterranean from Toulon, they may elect to keep their battle-ships in harbour at first, sending the majority of their cruisers to make raids on our commerce in the hope of drawing off our scouts, and then of being able to slip past our battle-ships. In the Channel this course might be even more advantageous to them, for our squadron there would either have to keep at sea, depleting their coal bunkers, or to lie at Plymouth with the chance of being unable to catch the French Northern Squadron before they could get to Gibraltar. What ever course they may adopt, we must provide that the exigencies of commerce defence do not require us to withdraw our scouts.

Having decided upon the main lines of our policy in stationing the battle squadrons, we must apply the same principles to our squadrons in other parts of the world. To do otherwise would be to act without a general idea and to incur the risk of dividing our forces. In whatever part of the world then the Dual Alliance have men-of-war, we must have others of the same type in greater force. Further, should France and Russia detach part of their forces from their European stations to others, we must do the same, taking them as far as possible from corresponding stations. The Chinese affair is an example.

The second group of stations contains those on which the Dual Alliance have a few ships. On these stations, North America and the East Indies, the French have a few cruisers in commission, and we must, therefore, have others either in slightly greater number or of greater power. These ships must be kept in commission for the same reason, as given above, for battle squadrons. But on these stations, as well as on those in the third group, Australia, South Africa, South America, and the Pacific, where there are no French or Russian ships stationed, we shall require some ships for commerce defence. In the second group the Dual Alliance have bases and coaling stations, but in the third they have very few places where their ships could coal, and they would, therefore, be the less likely to attack our commerce there. Probably the few ships we are obliged to keep in commission for police duties on both these groups would be sufficient for this purpose, but it would be advisable that there should be a few of a better class than the sloops and gun-boats at present stationed there. The ships on these stations may have to steam long distances or even to change their stations in chase of an enemy's cruiser, and, though we have more coaling stations than the Dual Alliance, a ship chasing must burn more coal than the ship chased, as she has to find her. It is unlikely that the enemy would weaken themselves by sending many ships to attack our commerce in these parts of the world, though those they do send will want some finding.

As to the class of ship to be apportioned to these different duties, we have first clearly to distribute our battle-ships so as to give us some advantage in each fleet over the battle-ships of the enemy. Ship for ship, ours are stronger and more homogeneous than theirs. Of these points we must take full advantage, for our superiority in numbers is very small. This having been done, we should allot to each battle-ship a scout. Of the enemy's battle fleet there then remains his coast-defence ships and armoured cruisers. We should meet both these, ship for ship, with our own armoured cruisers.

We are, it will be seen from the tables, very short of this class of ship, though there would appear to be two classes of the enemy's ships with which they would have to deal, and if we are to apportion one of

ours to each of these we shall at present have to use the larger protected cruisers to perform the duties of armoured cruisers. It is quite possible, as suggested above, that the enemy may send off his armoured cruisers to destroy our commerce, in which case we must send others after them. The watching of the enemy's fleet in harbour will have to be performed by our scouts, and they must have some heavier ships to fall back upon, or even in the absence of his armoured cruisers our scouts may be driven off at the critical moment by his coast-defence ships. With both fleets at sea, our armoured cruisers, which are really light battle-ships, would probably form a separate division, and may even be detached on separate service. For this purpose they should be provided with scouts, but we are too short of these to be able to allot any to them.

Auxiliary ships, such as hospital, coal, and store ships can hardly be said to exist in our Navy at present, but no doubt they will be provided by degrees. At present they would have to be taken up from the mercantile marine, and, so far as disciplined crews are required, they could be furnished by the Naval Reserve.

There remain now the destroyers and torpedo-boats. How far it will eventually be found advisable to keep destroyers with the fleet is perhaps uncertain. On the one hand, they may be very useful in warding off attacks on a blockading fleet, or in carrying messages; but on the other hand, their value for scouting purposes is almost nil, owing to their small angle of vision, and they would be a positive hinderance to a fleet at sea searching for an enemy. Probably their best station will be at the base port of the station, ready to accompany the fleet, to join it when required, or to act independently. For the protection of commerce they could be employed where this is threatened by torpedo-boats.

The duties of torpedo-boats will be taken here as to attack the enemy whenever a favourable opportunity occurs near the coast to which they are attached. Acting generally in groups under the command of a smart officer, they will have general directions as to the part of the coast they are to go to and the ships they may have to attack, leaving all details both as to when and how to attack to the officer in command. Some of these boats will be always in commission with a view to training their crews and gaining knowledge of the coasts they are to be employed on, but they, as well as the destroyers, will be under the Admiralty, and so will not form part of the defence of any port or part of the coast.

Commerce Defence.

In accordance with the arguments advanced above, it will be taken here that on stations where we have battle fleets there will be a separate organisation for the protection of commerce, in the shape of a special body of cruisers other vessels, under a rear-admiral or commodore,

these officers, as well as those commanding the stations in groups 2 and 3, being directly under a senior admiral in England, who will be in charge of the defence of commerce throughout the world. There is already in commission a Cruiser Squadron in the Channel under a rear-admiral, a similar squadron might be formed in the Mediterranean, and smaller squadrons in the North Sea and China under commodores—the class of ship being those suited to the station. These cruiser squadrons would be independent of the commanders-in-chief on the stations in war-time and might also be so in peace as in the present Cruiser Squadron in the Channel.[1] If that were thought inadvisable in foreign stations they might form part of his command, with the understanding that they were as far as possible to be kept a separate detachment, and to be practised in their special war duties.

The cruisers to be detailed for this purpose should be the best of the "protected" class after those required to do duty as armoured cruisers had been apportioned. The duty of these ships in war will be to find and attack the enemy's commerce-destroyers, following them if necessary without regard to station limits. There will also be the merchant-vessels on the Admiralty list of subsidised ships. These ships can be armed at the first naval port they reach after being taken up; they are already running on the principal trade routes, but it will be necessary to man them abroad, and, therefore crews must be provided at the base ports. Their principal duty will be the patrolling of the trade routes they are now employed on, and they should be encouraged to keep as many of the crew as possible belonging to the Naval Reserve. In addition to these two classes of sea-going vessels, there are others which will be useful in narrow waters such as the Channel, North Sea, parts of the Mediterranean, the entrance to the Red Sea, Singapore, the Straits of Sunda, inside the Barrier Reef, the West Indies, etc., where shipping passes on concentrated lines. For this purpose the four old broadside ironclads and the coast-defence ships might form bases for the sloops and gunboats not mentioned in the Admiralty return and also for destroyers and torpedo-boats. These ships when in reserve must be stationed at the nearest base ports to their war positions where crews can be obtained. When this is impossible the sloops and ships in commission for police duties would have to take their place as bases for destroyers. In many of these ports a depôt ship would be required, and this might be the coast-defence ship allotted to that district, but in others arrangements could be made for manning as suggested below for cruisers. The positions

[1] The author is not quite accurate in his remarks about the Cruiser Squadron. The Cruiser or Training Squadron is still commanded by a commodore, not a rear-admiral, and is not attached to the Channel: as a matter of fact, during the last few months it has spent far more of its time in the Mediterranean. Its future constitution seems to be still unsettled.—ED.

selected must depend partly on the shelter such craft can obtain and on facilities for coaling, but by patrolling the narrow waters in this way there would be certain fixed points formed where merchant-vessels could be sure of some protection. The enemy's commerce-destroyers are hardly likely to fight if they can avoid it, for the risk of being crippled would be too great even if they were successful, and if crippled their career would be practically over. We should therefore be able to employ even these weak vessels to some advantage.

It should be the duty of the admirals in charge of commerce-defence squadrons to arrange the best possible positions for the ships of whatever class they may have allotted to them. They should be kept informed of what ships they will have on the outbreak of war and where they are at any moment, whether in reserve or at sea, and orders should be drawn up and kept on board each ship, showing her position and duty on mobilisation.

Reserves.

If the statement were made that the British Fleet could afford no reserves, it would of course be an exaggeration, but it is not far from the truth, if by the term Reserves is meant reinforcements to the battle fleets before they can go into action against the mobilised forces of the enemy. Either the actual fighting fleets in commission must be strong enough to meet and defeat the enemy after he has mobilised, or we must be able to insure that the reinforcements shall have joined it beforehand. On general grounds it is clear that if we are to consider the enemy's coast our frontier, his reserve ships will have no distance to go after mobilising, while ours will have to steam from our base to join our fleet near his base. In the extra-European stations, with the exception of China, neither France nor Russia has any reserves, and we can therefore afford none except for commerce defence. In the European stations, though they have reserves, it would, in the case of the Mediterranean and Channel Squadrons, be impossible to ensure that we could reinforce our fleets before the enemy could do so to his. It is quite feasible for secret orders to mobilise to be given to the French twenty-four hours before we know it. The distance from Toulon and Brest to Gibraltar is less than from our bases to the same place, and it would obviously be impossible for us to mobilise and arrive there in time to stop a junction. In order to prevent this, our two squadrons if not already at Gibraltar would have to start immediately at full speed, sending out cruisers towards the French ports to get touch of the enemy, so that each might force an action with its opponent at the earliest time. The Russian Squadron in the Mediterranean may be counted upon to be practically within touch of the French, but their Black Sea fleet could hardly leave before war was declared, and a small division of the Mediterranean

Squadron would have to be told off to watch them, for we should have no time to commission and despatch ships from England or Malta for this purpose. Their Baltic Squadron would have to mobilise and so would be still in the Baltic, which would give us time to collect our coast and port-guard ships from the East and South coasts to oppose them, but if they had 24 hours' start in mobilising it is doubtful if we could meet them with any other ships before they had escaped to sea. Any ships, therefore, which we had to commission on the outbreak of war would only be of use either to assist in a blockade after it had been established or to reinforce the fighting fleets after they had fought an action. In China we have no base from which we could draw reserves of *personnel* nearer than Australia or Canada, the distances of which preclude the idea of reinforcements arriving in time to be of any service, and, therefore, on that station also we must depend entirely on commissioned ships to meet the enemy's battle fleets. So far as these fleets are concerned, we literally can not afford to keep any ships in reserve as reinforcements, that is, they cannot be brought into use until after the first developments have taken place. Therefore, the only reserves we can allow for the battle-ships are those which are not required to meet the mobilised enemy in the first instance, that is, we can keep in reserve only those corresponding to such ships of the Dual Alliance as may be undergoing repairs which would prevent them being commissioned for at least a week after the outbreak of war.

It will obviously be unwise to keep any of the newer battle-ships and scouts anywhere except in commission, and it may be doubted whether the old broadside ships with muzzle-loading guns, which still figure in the list of effective battle-ships, would be of any value. For cruisers, reserves would be invaluable and a constant supply of them desirable, but here again we must keep our proper proportion of scouts in commission. Circumstances will be sure to occur, as at the late manœuvres, where scouts are obliged to fight, and whether sunk or disabled, the fleet they are attached to will be seriously hampered until they can be replaced.

When it comes to the defence of commerce, however, the position is different. Our large self-governing Colonies provide a certain proportion of *personnel*, and in the case of Australia of ships also. On the first outbreak of war the enemy will detach certain ships to prey on our commerce, and the trade routes will want protection. It will inevitably take some time for the enemy to get his cruisers to the spots he selects, and a further time before we hear where these attacks are being made. In the meantime we may commission ships to deal with them. The attack on commerce will be made partly by cruisers—some of them specially built for the purpose—and partly by armed merchant-vessels. The enemy's

difficulty will be his want of coaling stations, and of this we shall doubtless take full advantage.

On the outbreak of war the cruisers in commission for commerce defence would at once proceed in search of any of the enemy's cruisers, which were known to be outside the harbour watched by our battle squadrons so as to bring them to action as soon as possible. The cruisers in reserve in England would commission and wait orders, their rôle being to chase any of the enemy's cruisers detached from his battle squadrons. Those in reserve on other stations would start immediately on commissioning along the principal trade routes connecting their base with other parts of the Empire so as to intercept any of the enemy's ships which had escaped. They would report their arrival by telegraph at the first place they touched at, and receive information as to what enemy's ships were on that route and where they should be looked for. The cruisers already in commission on the stations in Group II. would at once proceed to get touch of the French vessels on those stations.

Manning the Reserves.

If we keep cruisers at our colonial bases and arm merchant-ships there, we must be prepared to man them, and the only places out of England where we can do this are our large self-governing Colonies. We have, it is true, a training-ship for ordinary seamen in the Mediterranean, which would necessarily have to lay up in war-time. Her crew might, with the depôt-ships, furnish crews for two cruisers, provided that their crews were not required to fill vacancies in the fleet. But in Canada, Australia, New Zealand, and doubtless later on in South Africa, there are trained men ready and willing to be employed in the naval defence of the Empire, but so far, to a large extent, unorganised for this purpose. With proper organisation we ought to be able to keep whatever ships we want at these bases ready for mobilisation. This, however, involves the nucleus of a highly-trained force in sufficient number to fill the principal ratings in the ships to be commissioned. These must be provided from men and officers in full pay and training. The remainder of the crews would be provided by the colony from their naval forces. For this purpose it would be necessary to establish for each of these stations its own training schools, in addition to a depôt-ship, and to mobilise periodically for training. The bases in such Colonies might be organised on the lines of our home naval ports. A depôt-ship or barracks for men of all ratings, gunnery, torpedo, and signalling schools, and training arrangements for seamen and stokers. These ports should have a senior naval officer in charge of all the naval arrangements, there should be a sufficient staff of officers attached to the training schools, and ratings on the stations

should requalify there. Officers and men of the Royal Naval Reserve should also be allowed to go through their training on board these ships, and such men of the Fleet Reserve who might be there. The schools themselves might with advantage be the ships to be commissioned there in war-time, so that there would be a nucleus of highly-trained officers and men always ready and familiar with the ships they would have to serve in. The local naval force should be encouraged in every way, both officers and men, and made to feel that they had a definite part allotted to them in the naval defence of the Empire. This force on ordinary occasions is separated from the Navy and is under their own rules, but they should be required to amalgamate for periodical training with the Navy, under naval regulations, in the ships they would actually serve in during a war. With tact on the part of the officers of the schools there should be no difficulty about this, but it should be arranged that on mobilisation this force should be directly under the command of the admiral on the station and entirely independent of the Colonial Government. The Navy must be directly under the Admiralty in war-time. There must be no divided responsibility or command, and there should be no difficulty about this if the true functions of the Navy are recognised, namely, to keep the seas clear of the enemy, and not to defend the ports or coasts, and that for this purpose it will often be necessary to detach ships long distances from their base ports—sometimes to other stations.

The great divisions of the Empire beyond the sea have already recognised that the Navy is Imperial by providing certain sums of money for war-ships. They have already sent men freely to South Africa, China, and the Soudan, and there can be no doubt but that they would be prepared to fall in with some such scheme of mobilisation for the Navy which they could appreciate and understand, and that they would not hamper the Admiralty with restrictions as to where ships and men should or should not be employed, provided that the system to be adopted were made clear to them. Local conditions must, however, be taken into consideration. Local rates of pay, local ideas of discipline, local ideas of dress even, should be given due thought where such exist, and must not be allowed to prevent the thorough amalgamation of the Service into one efficient whole. Strict discipline is necessarily required in the Navy; but in war-time a good deal may be omitted in petty detail which would not be permissible in peace, and on mobilisation for drill, war, rather than peace, conditions should be observed.

On the East Indian Station arrangements could also be made to man commerce-defence ships, though, at present, the value of the Indian Marine Service is hardly taken into account. The officers and men of this Service are used to working together and are under discipline, but they are not sufficiently trained as a fighting force, nor would it be

possible to mix the men of that Service with our own. At the same time, with a certain leavening of petty officers from the Service, there seems to be no reason why an efficient force for war purposes should not be developed. Such petty officers would necessarily have to serve with the men in peace-time so as to learn their language and understand their character; but with this and a better war training for that Service there seems to be no reason why a force fit to take over commerce-defence ships in war-time should not be organised. It might be arranged that they should maintain and man two or three efficient cruisers in peace under the Indian Government, instead of their present obsolete vessels, so that there might be a constant training going on in their own Service; then on the outbreak of war they could at once pass into the Navy with other reserves.

Mobilisation.

The object of mobilisation is to put the Navy on a war footing by commissioning all vessels which can be of use, and the organisation for this purpose should be directed towards getting these vessels commissioned and ready for action as quickly as possible with the men best suited to them. The latter principle is sometimes overlooked, and it is then assumed that officers and men on the active list should be mixed with the various reserves to such an extent that a sort of uniformity may be arrived at. It appears doubtful if this is sound policy. The active list is composed of those who are accustomed to the newest ships and guns, the reserves to an older style of both. These newest ships will be the first to come into action, the older type being merely a reinforcement after the others have borne the first shock. It would, therefore, seem better to put into the first line those who can best do justice to the ships, and into the second the reserves. From the foregoing pages it will have been gathered that these are the lines here proposed. The battle fleets will already be in commission, also certain of the ships for the protection of commerce. There will remain some modern cruisers, destroyers, and torpedo-boats, also some old battle-ships and cruisers, as well as some armed merchantmen and the fleet auxiliaries, such as coal, hospital, stores, and repairing ships. The former group, *i.e.*, modern cruisers (at least those of them which are to be employed for fleet work), the destroyers and torpedo-boats, should be manned from the active list; the commerce-defence cruisers at our bases in the Colonies by the Colonial Navies, depôt-ships and training schools; the older battle-ships by the officers on the retired list and men of the Fleet Reserve; and the merchant cruisers and auxiliaries by the Naval Reserve. In the case of all but the auxiliaries, the captains and gunnery officers should be taken from the active list, as also should the captains of guns and to some extent the signal staff. The reserve battle-ships would then be manned by both officers

and men who, while in the Service, had been used to this class of ship. They would soon feel at home in them and should, by the time they had joined the squadrons to which they were to be attached, be able to take up their duties efficiently. Similarly with the merchant cruisers and auxiliaries, their crews would have been used to the class of ship they would be employed in and so would the sooner get into the work, but an exception would have to be made in the case of ships employed to "mother" destroyers and torpedo-boats attached to the battle fleets, where at least the majority of the crews should be from the active list. Of course it would be impossible in practice to make quite such hard and fast lines as these; there will, for instance, be certain officers and men of the Naval Reserve serving in the fleet when war breaks out, and these cannot be exchanged and sent to other ships; but if these general principles were laid down, those liable to be called out in war-time would know what to expect and would feel that the work they would have to do would be such as they were familiar with. There are, however, on all these auxiliary lists a certain number of both officers and men who are somewhat too old to take the positions here assigned to them. These could be usefully employed in the very responsible duties of coaling, obtaining and sifting information, and relieving some of those at the Admiralty, in depôt-ships, and barracks.

It would conduce to efficiency if the officers on these reserve lists could be kept informed of the ships they would have to join on mobilisation. This would involve a certain amount of correspondence in peace-time, for necessarily there would be alterations from time to time; but if an officer knew what ship he would be called upon to join, he would in most cases take some trouble to make himself acquainted with her structure and armament; or if he would have to undertake other duties, he would ascertain how these duties could best be carried out. But in such cases it would be necessary to arrange that the officers seeking the information were given facilities to acquire it. The watch and station bills for reserve ships might be already made up for them, with the exception of the actual names of the men. This could be done from the watch bills of their last commission or from those of similiar ships. Small plans of the ships, showing pipes and fittings, others giving plans of the armour and details of armament might be prepared and copies printed, extracts from the ship's book might also be useful, and generally any information which would enable the officers to know their ships. Such details would hardly be required for ships to be commissioned from the active list or in the Colonies, for in the former case the officers may be presumed to know, or to be in the way of easily obtaining the necessary information, and in the latter it is assumed that they will have mobilised in their ships during peace. For such ships as

are to be manned to a large extent by reserves, such details would be very valuable, as allowing more time to be given on mobilisation to preparation for battle.

With regard to stores for ships not in commission, it is an open question whether it would not be advisable to adopt the German system and to put every possible store required by each ship in one place. This would save time, though it might waste space. The arguments in favour of this system are certainly strong, and it seems worth a trial. Difficulties in connection with storekeeping accounts are not insuperable, and in all probability if our dockyards were organised more on a military as opposed to a civilian basis (as in Germany) it would be adopted. On the other hand, our present system works well, and it will naturally be asked why we should alter it. There could be no objection, however, to giving the other system a trial, and with a view to this it might be adopted in one of the naval ports as an experiment.

All ships in reserve should have the gear removed which would be thrown overboard before an action, with the exception of boats and certain cabin and lower deck fittings. There can be no object in our old masted battle-ships taking a lot of spars and sails to sea with them or for the older mastless ships to take more woodwork to sea than can possibly be helped. They are not being manned for a three years' commission in peace-time, but for war, and the less they have that is not absolutely necessary the better. The weight of these stores could be far better utilised in additional coal and ammunition.

When the orders to mobilise are issued, the crews of such vessels as are to be manned by reserves cannot all arrive at the same time at the dockyard, but there should be no necessity to wait for this to hoist the pendant; valuable time for getting stores on board would be lost by this means. If all the stores belonging to the ship were in one place and the ships were moored as near it as possible, working parties could be organised as soon as the first few men arrived.

Summary.

The arguments advanced and the conclusions arrived at above may now be summarised:—

1. It is necessary for our existence as an Empire that we should have the command of the sea, and the coalition most likely to challenge this would be the Dual Alliance. We must, therefore, be prepared to defeat or contain their battle squadrons and protect our commerce. In order to properly perform these duties, the Navy must be free to adopt offensive strategy and to send its ships and men to the frontier, *i.e.*, the enemy's coast, without being hampered

by port or coast defence. A dividing line between naval and military command is required and the 3-mile limit suggested.

2. The exigencies of commerce defence may require ships to proceed to any point independent of peace stations. Scouts and commerce-defence ships have essentially different duties, which cannot be combined, and the admirals in command of battle fleets should have a free hand. It is, therefore, suggested that the defence of trade routes should be entrusted to an admiral specially appointed.
3. The battle fleets in all waters require to be kept at full war strength, including the proper proportion of scouts. Commerce-defence ships can be partly in reserve in various ports at home and in our self-governing Colonies. At these bases there should be depôt-ships and training-schools.
4. The port and coastguard ships are here counted as a battle squadron and require a proper proportion of scouts.
5. Torpedo-boat destroyers should be attached to the base ports of stations, some part being always in commission. They should not accompany the fleet to sea, but should be prepared to join it or act independently as required. Torpedo-boats should be attached to certain parts of the coast, not to defend it, but with a view of making raids on any enemy's ship in the neighbourhood. Fleet auxiliaries to be kept in commission where they can be usefully employed.
6. Fleet cruisers in reserve, destroyers, and torpedo-boats to be manned on mobilisation by depôt-ships, barracks, and schools (active list), commerce-defence ships, old ironclads and old cruisers, by officers on retired list and fleet reserve in England; commerce-defence ships abroad by colonial navies; armed merchant-ships and fleet auxiliaries by Naval Reserve. Each ship manned to have captain, gunnery officer, and certain ratings from active list.
7. Officers in various reserves should be kept informed of the ships and ports they will have to join on mobilisation, and be afforded facilities for obtaining information as to details of these ships and duties. It is suggested that the German system of stores for mobilisation should be tried in one of the dockyards, and that all spare gear not required for battle should be eliminated from ships in reserve.

Notes on the Tables.

A distribution of the fleet on the foregoing basis must depend principally on the position and readiness for war of the French and

Russian ships, details which only the Admiralty can know with any accuracy. In attempting such a distribution, therefore, it must be taken as merely an illustration of the ideas expressed above and as liable to considerable modification were fuller information on these points obtainable.

It is assumed that the French and Russian ships are distributed as shown in Tables II. and III., and our own fleet is apportioned accordingly. Victory in the end must be decided by the battle squadrons, and it is, therefore, imperative to provide first for them. This implies a considerable reduction of our squadrons on extra-European stations, and a general concentration of the fleet. In view of the increase of the French and Russian Navies, this appears to be necessary.

TABLE I.

Fleets of Great Britain, France, and Russia (Admiralty Return of Ships built, 28th March, 1901).

——	France.	Russia.	France and Russia.	Great Britain.
Battle-ships—				
Less than 10 years old	13	8	21	24
10 to 20 " "	11	6	17	13
20 to 30 " "	4	1	5	9
Over 30 " "	—	—	—	4
Coast-defence Vessels, Armoured—				
Less than 10 years old	1	6	7	—
10 to 20 " "	8	1	9	—
20 to 30 " "	5	7	12	10
Cruisers, Armoured—				
Less than 10 years old	4	3	7	—
10 to 20 " "	3	4	7	9
Over 20 " "	—	4	4	—
Cruisers, Protected—				
Less than 10 years old	22	2	24	63
10 to 20 " "	16	1	17	40
Cruisers Unprotected—				
Less than 10 years old	—	—	—	—
10 to 20 " "	2	—	2	9
20 to 30 " "	5	3	8	2
Torpedo-vessels—				
Less than 10 years old	7	6	13	16
10 to 20 " "	8	9	17	19
Destroyers—				
Less than 10 years old	9	10	19	89
Torpedo-boats[1]—				
Less than 10 years old	25	40	65	6
10 to 20 " "	190	20	210	80
Over 20 " "	22	111	133	9

[1] Distribution according to age approximate.

TABLE II.

Distribution of Battle Fleets.

	Mediterranean.			Channel		North Sea.		China.			Proportion which could be kept on a peace footing.
	F.	R.	B.	F.	B.	R.	B.	F.	R.	B.	
Battle-ships—											
Less than 10 years old	7	1	10	6	7	2	2	—	5	5	
10 to 20 ,, ,,	5	4	7	6	6	2	—	—	—	—	
20 to 30 ,, ,,	3	—	4	—	—	1	4	1	—	1	
Coast-defence Ships—											
Less than 10 years old	—	2	—	—	—	—	—	1	2	—	On European stations, only so far as corresponding ships of the enemy are under repair and cannot be commissioned for at least a week after the outbreak of war.
10 to 20 ,, ,,	4	1	—	3	—	2	—	1	—	—	
20 to 30 ,, ,,	3	2	—	2	—	4	—	—	—	—	
Armoured Cruisers—											
Less than 10 years old	2	—	—	1	—	—	—	1	3	—	
10 to 20 ,, ,,	1	—	3	1	2	—	—	1	4	4	In China, none.
20 to 30 ,, ,,	—	2	—	—	—	2	—	—	—	—	
Protected Cruisers—											
Less than 10 years old	6	2	13	4	5	—	8	7	—	10	
10 to 20 ,, ,,	8	—	3	7	6	—	1	—	1	1	
Cruisers, Unprotected—											
10 to 30 years old ...	2	—	—	—	—	—	6	—	—	—	
20 to 30 ,, ,, ,,	2	3	—	3	—	—	—	—	—	—	
Torpedo-vessels—											
Less than 10 years old	3	2	10	3	3	2	3		2	—	
10 to 20 ,, ,,	4	4	8	4	4	3	2	—	2	5	
20 to 30 ,, ,,	—	2	—	—	—	—	—	—	—	—	
Destroyers...	5	3	18	4	18	2	6	—	5	6	
Torpedo-boats	100	60	20	100	35	60	20	37	51	20	Two-thirds to three-fourths.
Position of Reserves ...	Destroyers and torpedo-boats at station bases, remainder in England.			Home ports.				At station bases.			

TABLE III.

Distribution of Commerce-Defence Ships (British).

—	Mediterranean.		Channel		North Sea.		China.		East Indies.		North America		Cape.		Pacific.		Australia.		S. E. Coast America	
	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.	Commission.	Reserve.
Battle-ships over 30 years *Coast-defence Ships*— 20 to 30 years	3	—	—	3	—	3	2	—	1	—	1	—	1	—	—	—	—	2	—	—
Protected Cruisers— Less than 10 years ...	2	3	6	—	2	—	2	—	3	2	4	—	1	—	—	—	—	2	—	—
10 to 20 ,, ...	4	4	—	10	2	4	1	—	—	—	—	2	—	—	—	1	—	—	1	—
Destroyers...	4	8	4	8	2	4	3	3	—	—	—	3	—	—	—	—	—	—	—	—
Position of Reserves ...	Destroyers and two cruisers at station bases, remaining cruisers England		Home ports.				Station bases.													

Note.—It is assumed that the French have in the East Indies 2 and in North America 3 protected cruisers, all less than 10 years old, and on the latter station 1 other from 10 to 20 years old. The sloops and gun-boats will be distributed as required during peace for police duties, some of them moving to other stations for war, *e.g.*, those on West Coast of Africa to Mediterranean, those on East Coast to Aden and Zanzibar, those on South-East Coast of America to West Indies, while those in reserve in England would be distributed round the coasts. The armed merchant-vessels would patrol their own trade routes, manning at the first naval base they reached.

INDIA'S POWER TO AID THE EMPIRE.

By Major A. C. YATE,
29th (Duke of Connaught's Own) Baluch Infantry.

THE vast power, active and passive, which is embodied in our Indian Empire, is a reality that cannot but impress itself on the mind of any thoughtful Englishman, true though it be that the bulk of the English people pay little heed to Indian affairs.

The Secretary of State delivering his annual Indian Budget statement to—as he himself remarked last August—"an empty House," is a scene that has passed into a byword. The pulse that records the vitality of the greatest dependency of the British Crown beats but rarely in unison with the sensations that rouse the blood and engross the attention of the British nation.

Nevertheless, there is scarcely a family in the British Isles that has not some link with India; and in the hour of real need, as of famine and war, the mother country has never failed to show her interest and sympathy in the most practical form. The position of India, commanding the central maritime route between East and West, is a distinct point of advantage, whether for the pursuit of commerce or the conduct of war. An import and export trade, valued at more than £130,000,000 per annum, and a population of 300,000,000, represent figures that speak for themselves. On the other hand, if India is a great source of strength to the British Empire, it is also a grave responsibility, the internal administration of which demands eminent tact, and the external relations unceasing watchfulness. Conditions change from day to day. We see at this moment a cordon of foreign lines of railway, German through Asia Minor and Turkish Arabia, Russian in Persia and Central Asia, French in Indo-China and Yunnan, being drawn, or about to be drawn, closer and closer round the frontiers of India. In each of these railways there is a possible menace to that great territory. The three Powers that impel them onward may possibly combine to endanger our tenure thereof, unless we succeed in playing off one against the other two. The forecasts of diplomacy, however, share the weakness of all prophecy. The death of the Amir of Afghanistan is a case in point. So far from the demise of the Crown resulting in anarchy and an Anglo-Russian imbroglio, the

succession has been peaceful, and the new Amir has not hesitated to issue proclamations which are, in some respects, tantamount to a reversal of his father's principles of government. Leniency and liberality are to replace the hand of iron. Whether this new departure is premature, time will show. Meantime, the Afghan monarchy stands firm, and that is what British interest requires. We would that Persia were equally independent and strong. For the moment our weak point lies there. The great influence that Russia commands at Teheran, and Germany at Constantinople, is threatening our supremacy in the Persian Gulf. Both those Powers aim at a foothold on that Gulf, whereas the security of our rule in India and our commercial interests in the East demand that no such point of vantage, menacing our line of communication, should be in the hands of the two most powerful Continental nations. Many and varied are the proposals for solving this difficulty; some even advocating conciliation of, or compromise with, Russia—a very doubtful policy. Time only will solve it. We, however, must so strive to utilise time that when the crucial moment arrives the dominant position in the Persian Gulf will be ours. The Anglo-Japanese Agreement may make its influence felt outside China and Corea. The policy of Germany and Russia alike in the Near and Far East points to a certain collision between them at no very distant period. Russo-German rivalry will probably be our opportunity. Let not Englishmen suppose that the Government of India is callous or inactive. Recent events at Koweit indicate clearly the contrary, and in the personality and known policy of the present Viceroy we have an ample guarantee that British interests will be safe-guarded. Add to this the continual construction or projection of lines connecting the chief strategical centres in India with its frontiers, for instance, from Central India, Rajputana, and Bombay towards Sind, the Punjab, and Baluchistan, from Quetta to Sistan, from the North-Western main line to Dacca, Bannu, and the Zhob Valley, from Mandalay to Lashio, and last, not least, from Calcutta across Assam into Burma. If the foreign railways referred to above are the sap that threatens India, these lines are the countersap.

Unless Professor Seely's "Expansion of England" has been written in vain, the conflicts of our troops in the eighteenth century with those of France in America and in the East and West Indies did much to develop the resources and resourcefulness, as well as the naval and military power, of Great Britain. In 1800-01, Sir David Baird led 7,000 troops (5,000 British and 2,000 natives) from Bombay to Kosseir on the west coast of the Red Sea, and thence crossed the desert to the Nile. While he was helping to frustrate the military plans of Napoleon, Captain Malcolm at the Court of the Shah of Persia was opposing diplomacy by diplomacy. Baird assisted in confirming the all-important results achieved by Nelson's

success at the battle of the Nile, by Abercromby's victory at Aboukir Bay, and by General Hutchinson's subsequent operations. Napoleon's expedition to Egypt was the prelude of an ambitious scheme for the substitution of French for English supremacy in the East. The Governor-General of India by despatching Captain Malcolm on a diplomatic mission to the Court of the Shah, and Sir David Baird with a small army to Egypt, materially aided Great Britain in defeating the Napoleonic aspirations.

The first Afghan war of 1838-42 and the Persian campaign of 1856-7, though carried out entirely with troops in the service of the H.E.I. Company, were undertaken in pursuance of Imperial policy. Ere the Indian troops had evacuated Persia, the Mutiny, foreseen by such men as Major Eldred Pottinger, Sir Charles Napier, Sir William Sleeman, and General John Jacob, and fomented, though not foreseen, by more than one Viceroy, had broken out. As a consequence thereof the Army of the H.E.I. Company became the Army of the Crown. Its first Imperial service in that new capacity was to furnish an expeditionary force for China in 1860 under Sir Hope Grant. In 1869, when King Theodore of Abyssinia proved obdurate, India, represented by Sir Robert Napier and a force mainly drawn from the Bombay Presidency, again showed her will and power to vindicate British prestige, and the rights of British subjects. In 1878 Lord Beaconsfield made that move to Cyprus which showed the civilised world that in future, in any struggle between Great Britain and her enemies, the Army of India was a factor to be reckoned with. Unfortunately the tortuous diplomacy of Russia and the credulity of the Amir Sher Ali Khan very shortly afterwards obliged the Indian Government to embark on the second Afghan war—a campaign which lasted two years and a half and necessitated the maintenance of from 50,000 to 60,000 men in the field. It was not, however, fought in vain, for it gave us as an ally the Amir Abdurrahman Khan, who for twenty years ruled and reformed his country, and then passed on his crown in peace to his son, the Amir Habibullah Khan. Afghanistan, under such conditions, is a powerful bulwark to the Indian Empire.

The Burmese campaign of 1885-8, the final consummation of the earlier wars of 1828 and 1852, gave the Army of India ample occupation for three or four years. It involved Imperial interests of the greatest importance, as the subsequent progress of France in Indo-China sufficiently testifies. Besides this, India sent military contingents to join Lord Wolseley in Egypt in 1882, and to Suakin in 1884-6, and it was practically, but unfortunately not entirely, to India that the demarcation of the Russo-Afghan frontier from Zulfikar to Sarikol was entrusted. Since then the pacification of our possessions in Eastern, Central, and Western Africa has been effected in a great measure by native troops

despatched from India, or by native contingents under British officers specially raised for service in Africa. Finally, in 1899, India sent about 10,000 British troops to Natal, and in 1900 about 20,000 native troops to North China.

Such is the record *en bref* of what India has done, from a military point of view, in the last century to help the mother country. The dawn of a new century and the opening of a new reign can bear witness that it is no less ready and able now to aid the Empire. India has not yet known what it is to have to strain every nerve to defend herself and to co-operate in protecting British rights and interests throughout the world. That that time will come may be regarded as a certainty. Mr. Rudyard Kipling, some months age, condescended to console his fellow countrymen with the assurance that we "may be an Empire yet." A Briton might be excused, as he looks round the world, or as he listened to Lord Rosebery's stimulating oratory at Winchester on the occasion of King Alfred's millenary, or witnessed the reception accorded to the Prince and Princess of Wales on their return from an eight months' tour, during which they travelled 40,000 miles, in believing that we are already an Empire—and a very great Empire, perhaps the greatest the world has ever seen. Of that Empire, India is one of the mighty pillars, taking and bearing its own burden of responsibility. In India we find a livelihood for half a million or so of England's choicest manhood, and maintenance for a fine army of a quarter of a million men. Such a possession is worth some risk.

The danger of native disloyalty is one that cannot be ignored, but it is minimised by the justice and tact of our rule and by the prosperity, peace, and happiness which that rule has brought to the bulk of the population. Malcontents there are, as the regrettable incidents of 1897 remind us; and, curiously enough, those malcontents would seem to belong to the very class for whom our system of education in India (which, in the opinion of the present Viceroy, urgently requires reform) has done, or tried to do, the most. Bearing in mind however how extremely ignorant both the British Press and the British public are about the true condition of India, how prone that Press and public are to catch at and foster any sensation with but scant regard for truth, and recalling the ludicrous letters and articles which thronged the columns of the daily papers a few years back *à propos* of the so-called "mysterious tree-marking," it is best to give specific reasons why a second mutiny is improbable. In 1857 we had just brought to a conclusion the Crimean War and Persian Expedition. Owing to those campaigns, the British garrison had been reduced to 30,000 men. It was scattered in small bodies, unconnected by rail and telegraph, over a vast area. The Native Army was still mainly recruited from the North-West Provinces and Oudh, but already the Sikh, Pathan, Punjabi, and Gurkha were finding their way into it. The

Mahommedan Brahmin of the North-West Provinces and Oudh realised that the Bengal Army was no longer a "close borough" for them. The mistaken policy of the Indian Government had robbed native regiments of their best officers and loosened the bands of discipline. The Sowars and Sepoys of Bengal, the Mahommedan and Brahmin, determined, while there was yet a chance, to make a bold bid for freedom. The annexation of Oudh had added fuel to the fire of their discontent. Such, briefly, were the motives and causes that led to the Mutiny. To-day the conditions are entirely altered. The Native Army is no longer mainly composed of one class of men[1]; the British garrison is now numerically more than twice as strong as it was in 1857; all the artillery, except some ten mountain batteries, is manned by Englishmen; all important centres are held in force, and the telegraphs and railways facilitate concentration on a given point in a manner that was unknown forty years ago. From some points of view our rule was in greater jeopardy in 1842 and 1857. Fortunately on both occasions we had able, and mostly younger, men ready to replace the effete administrators and soldiers, whose errors and incapacity had brought about crises fraught with the gravest danger. Finally, there is among the native races neither homogeneity, unity, nor the power of leadership. What Sir Alfred Lyall wrote in 1864 ("A Sermon in Lower Bengal") is true still in 1901:—

"Yea, you Mussulmans are many, and their fighting men are few;
Prayer is good—but practice better—what is it that ye can do?
Will ye fight for this fair heritage, this Empire that ye lost?

* * * * * *

No—your brains are dull with eating, and your hearts are choked with lust,
And your seat is loose in saddle, and your scimitars are rust;
Ye are cankered by the luxury that keeps you rich and weak.

* * * * * *

Nay, though your spirits be willing, your flesh is but weak for crusading,
When I face Englishmen's cannon, I want better stuff at my back."

The loyalty of the native troops has been very fully proved of late years. The ties that bind them to Great Britain grow daily closer and closer. Some hundreds of picked native officers and soldiers have visited England and taken part in all the great national pageants of the last twenty years. Some hundreds more, it is said, will attend the Coronation

[1] *Vide* "India: Its Fighting Races and Its Army," in the JOURNAL of the R.U.S. Institution for November and December, 1901.

of King Edward VII. The sons of the leading native chiefs are now educated at Eton and Harrow, Oxford and Cambridge. Thousands of native gentlemen have taken degrees in our Universities, and qualified in Great Britain for the legal, medical, and other professions. Every branch of the Government Service in India is open to them, except the highest appointments in the Executive Branch of the covenanted Civil Service and the commissioned ranks of His Majesty's Army. And now, under the auspices of the present Viceroy, a step has been taken which promises to gradually remove this last disability. An Imperial Cadet Corps for the sons of Indian Princes, nobles, and gentlemen, is, with the approval of the King, about to be formed. The King, in testifying his cordial approval of it, desired it to be made known that he welcomed this opportunity of testifying his confidence in the loyalty of his Indian feudatories and subjects in the opening year of his reign. One of the greatest and most soldierly of these feudatories, scion of a race of soldiers and sportsmen, the Maharajah of Jodhpur, went to Frogmore recently to lay a wreath on the tomb of our great Queen Victoria. By one of those curious coincidences which upset calculation, the first natives of India to receive British Army commissioned rank were those doing duty in the Indian Medical Service. With this exception, such rank, when conferred on a native of India, has always up to the present been "honorary." There is no question that that qualificative epithet "honorary" is not popular in Indian circles. The real thing is what they like, and the Imperial Cadet Corps is a stepping-stone to the real thing. When we see India, as we do, producing men who show themselves well qualified to hold their own in science and in literature, and in any social, political, or professional circle in Europe, we realise that His Majesty's feudatories and subjects, whether they claim Great Britain or the Colonies or India as the land of their birth, have much in common. It is the union of these and of their interests throughout the Empire that makes our strength. To the Army of that union India contributes about 200,000 volunteers and native troops, in addition to the British garrison of 70,000 which it maintains. Nor does that number represent the full measure of its strength.[1] That will be best shown when the call "to aid the Empire" comes. Great Britain did not know her strength until the South African war called the military energies of the Empire into being, and not even yet have those energies been exerted to the full.

To grasp what India does in any given year to promote the efficiency of its Army we must turn to the memorandum contributed to each annual

[1] *Vide* "The Army of India, its place in Imperial Defence," by Sir Edwin Collen, *Empire Review* for December, 1901.

budget statement by the military member of the Viceroy's Council. The last one to which we have access is that drawn up by Major-General Sir Edwin Collen on the eve of the completion of his five years' tenure of the military membership. It is a *résumé* of the measures taken in 1900-01 and about to be taken in 1901-02 to make the Indian Army as efficient as funds and foresight will permit. The chief points enumerated in that memorandum are these:—The re-armament of the native infantry with the ·303 rifle; the provision of three extra howitzer batteries; the increase in number and the re-armament of the mountain batteries, and one or two other improvements in details of artillery equipment, such as the adoption of the spade brake and Grenfell sight; the arming of each British infantry battalion with a pair of machine guns; the addition to native regiments of 225 officers; the formation of five schools of instruction for mounted infantry; the issue of binoculars, telescopes, and bandoliers for the use of mounted troops; the provision of extra practice ammunition both for artillery and infantry; and lastly, the formation at convenient centres of cadres of mule and camel corps, which, in time of war, can be expanded rapidly into transport corps fit for service in the field. The Estimates for the year 1901-02 provide for an increased military expenditure of about £1,300,000.

Three of the most serious disabilities under which our Army in India labours are these:—

1. Paucity of officers.
2. The removal of officers, non-commissioned officers, and men, temporarily or for prolonged periods, from their regiments and corps for purposes of instruction or for special employ.
3. The incubus of endless correspondence and office work. Some commanding influence is needed to remove these disabilities, and so promote the true efficiency of the Army.

In view of the fact that India is menaced principally from the North-West, it appears to be desirable that the Trans-Indus territory from the Hindu Kush to Karachi should ultimately be formed into one civil province and one military command. The days of Sir Charles Napier, when the Sutlej was the western boundary of the H.E.I.C.'s territory, and when Sind was severed from Central India by an impassable desert, are no more. The entire frontier from the seaboard to Chitral is now closely linked by rail, road, and telegraph with the Punjab, Rajputana, and Central India. The waterway between Bombay and Karachi is no longer the sole channel of communication. To meet the ambitions of foreign Powers who threaten India and India's interests through Afghanistan, Persia, and the Persian Gulf, we surely need a united Frontier Government, with its own army corps and its own naval station at Karachi. The one step taken this year, viz., the formation of the North-West Frontier

Province, is a step in this direction. Russia took less than a quarter of a century to unite two Central Asian provinces under one Government. Provincial and presidential jealousies have delayed the union of the North-West Frontier for twice that period. It was in the early fifties that the idea was first mooted, and the names of Sir Herbert Edwardes and Sir Harry Lumsden mentioned as likely men for the post of chief commissioner. In the half-century that has elapsed since then the comparatively narrow strip of Trans-Indus territory has expanded until it marches with the borders of Persia and Afghanistan, from the Gulf of Oman on the south to the place "where three Empires meet" on the north. It is on this territory that must fall, as far as one can foresee at present, the brunt of any attack from without; and if we would have it strong for defence, let it be formed into one united civil and military administration. A divided control is a fruitful source of weakness.

There is one point specially noticeable with regard to the indigenous races of Baluchistan, and that is, that, in contradistinction to the Pathan tribes, which furnish thousands of recruits to our Native Army, they contribute nothing to the military strength of the Indian Empire. That this is so, appears to be due to a combination of fortuitous and perverse influences. Corps of irregular levies and guides have been repeatedly raised from them, and as often disbanded. In 1857, 500 of them under Lieutenant Macaulay marched from Upper Sind to Central India, and aided Sir Hugh Rose in suppressing the Mutiny. Their conduct was exemplary. Had Sir Robert Sandeman's rule been prolonged, and a perfectly free hand been given to him, there is every reason to believe that he would have established a Baluch Irregular Force on the lines of the well-known "P.F.F." But at that time the military authorities looked askance at irregular corps not under the orders of the Commander-in-Chief in India, and were determined to encourage no new departures in that direction. The result is that a martial population capable of contributing 20,000 men to the forces of the Empire contributes nothing. We have there the material for horse, foot, camel corps, and transport, and we make no use of it. If the Border Militia of the New Frontier Province is a precedent of any value, the creation of a powerful Baluchistan Militia can only be the matter of a few years. It needs but the good-will of the Chief Commissioner and the sanction of the Viceroy. The officers to do it may be found in the existing Baluch and Baluchistan Regular regiments, which are Baluch only in name; and from those regiments, too, might be obtained the native instructional staff which would be essential for the leavening and disciplining of the raw Baluch levies. It is a recognised fact that on the martial races of Baluchistan the yoke of military drill and discipline must

be allowed, at least at first, to fall lightly. Not that this means the condonation of crime or disobedience. Lieutenant Macaulay, as Shand's "Life of Jacob" shows, had his 500 Baluch Irregular Horse thoroughly in hand.

This is but an imperfect sketch of India's military power. What that is will only be shown when the great occasion comes. As a base of operations India is admirably situated. It was not without reason that the present Viceroy spoke of it three years ago as "the pivot of the Empire."

MILITARY OBSERVATIONS ON THE WAR IN SOUTH AFRICA.

(*Concluded.*)

Translated, by permission, from the "Militär-Wochenblatt," Beiheft 8, 1901.

Continued from March JOURNAL, page 363.

Extract from the "Militär-Wochenblatt":—

"These observations on the South African War, sent to us by a German who took part in it, are published here on account of the Military lessons which may be derived from them."

I have come, therefore, to the following conclusions:—Artillery duels, such as the next European war is expected to produce, have rarely taken place in South African engagements. Numbers on the one hand, skill and material on the other, were worthless. But since the British, with a superiority of three or four to one, succeeded only sometimes with difficulty in silencing their opponents, and generally did not succeed at all—and this would have happened even less often had the Boers been braver—I believe that in a battle where the artillery on both sides is about equal in numbers the absolute superiority of either side will seldom take place.

It will, therefore, become the duty of infantry to first advance under both hostile artillery and infantry fire, often perhaps indifferently supported by its own artillery, and then to assault and try to snatch the victory. I believe that it will frequently be able to do this, even when its own artillery is inferior, for I do not consider that infantry is so dependent on the sister arm. But we must go on endeavouring to suit our tactics more fully to the conditions of modern fire-arms than we have been doing of late in peace-time.

Fire effect and provision of cover from beginning to end are the essentials for all arms, especially infantry. Everything else, even time and distance, must give way, if higher considerations do not absolutely exclude it.

Great as is the effect of shrapnel at objects in the open, all that can be obtained by it against a defender under cover, even when the opposing artillery has been silenced, is to hold him down and prevent him firing. The advance of one's own infantry can be very well supported

by this means up to within short ranges; but only to the moment when the firing lines on both sides have approached to within such a distance of one another that artillery fire must cease. But up to this point the defender, if he has imitated the methods of the Boers, will not have suffered much loss, and the last 100 metres, and even less, are quite sufficient to destroy with rifle fire alone a much superior attacker, who gets up and rushes forward.

Infantry must, therefore, be trained in the last stage of the attack to fight "on its own" against an unbroken enemy, and the material advantages in a frontal attack are far more on the side of the defender than the attacker. This last fight may be prolonged for hours, and to make its success possible very considerable infantry forces will be required. An attacker, who before this stage is reached, has been weakened and shattered will have little chance of carrying his assault to a successful conclusion.

Losses usually mount up in an engagement in a few moments, whereby the morale of the troops immediately concerned suffers considerably. These moments are, as a rule, those in which larger targets are offered to the enemy. Large targets at medium ranges will, as a rule, suffer heavy losses; whilst small ones, on the other hand, at short ranges, often suffer remarkably little.

Men can lie on their stomachs for hours under fire without suffering great loss, but to get up once might cost a body of troops excessive bloodshed in even one minute; so much so that if it were to expose itself frequently or for any length of time in such a manner, it would, as a rule, be annihilated before it could itself effect anything, or at least would have lost so much as to be incapable of offering effective action later on. Sufficient cover against rifle fire can usually be obtained by lying down, even in the open; but against shrapnel, once the enemy has found the range, the cover is far less. There are not, however, sufficient instances of the latter to enable us to draw comparisons with the effect of our artillery fire; still, I have formed the opinion from the imperfect examples these offered, that an advance of infantry in open country against artillery is just as useless as against infantry. Even at great ranges an advance of a few hundred yards under shrapnel fire are quite sufficient to decimate the troops, or, at any rate, bring them to a standstill. I have seen this in the case of the English at least twice. Of course, it is necessary that the range be accurately determined. Therefore, the best cover against shrapnel fire is to keep out of the enemy's view as long as possible, so as to keep him in uncertainty.

The reinforcement of troops in the firing line from the rear, can rarely be carried out, except under cover, when within effective fire, especially rifle; for these reinforcements, as long as the opponent has

enough cartridges, will not even reach the firing line or will suffer losses out of proportion to the advantage gained; in fact, they will be of no more use than had they been placed in the firing line in the first instance. The most dangerous place on a battle-field is the last 200 to 100 paces in rear of troops which are under a heavy fire. Getting into the firing line is usually more difficult than maintaining a place there, and running forward to it is generally impossible. The supposition in this case naturally is that the ground is open. Losses in such positions increase so tremendously in a few moments, that those who are left are usually almost morally beaten. An advance of the firing line is, as a rule, no longer to be hoped for from the latter, and it is well known that it is more serious for troops to lose 20 per cent. in a few minutes than 50 per cent. in the whole day. The moral effect is all the more increased by the depressing feeling of being absolutely defenceless against one's opponent. For troops in actual movement are for the time being always defenceless.

This is especially the case with troops drawn up in rear, as their own troops in front of them prevent them from firing. Infantry can only hope to make their fire effective against an enemy lying down under cover, if they are able to fire with success at the heads of the defenders. This is only possible at the very earliest at ranges under 500 yards. Beyond this distance all that the fire can accomplish is to disturb the opponent and thus weaken the effect of his fire. For this reason, no doubt, fire on the part of the attackers at ranges between 1,000 and 800 yards is to be recommended, whilst single detachments or groups fire and advance alternately. Still one can seldom promise oneself much success in such tactics for carrying out frontal attacks over open ground.

Taken on the whole, however, our infantry whilst maintaining the skeleton of their present formation in action, must fight after the manner of the Boers, both in the attack and the defence. It is no longer possible to drive an enemy from his position—he must be shot out of it. This no doubt requires more time, but it is usually the only way of ensuring success. So great is the power of the present rifle, that results amounting to the annihilation of the enemy can be attained by it, where formerly the attack with the bayonet was necessary. The attacker must thereby, where possible, offer the same target to the very last as the defenders, and make just as good use of his weapon as the latter in the last stages of the attack.

Naturally this can rarely be fully accomplished, and frequently not even approximately. The greater weight in lead of the defender must be equalised by the concentricity of the attack, *i.e.*, fire must be concentrated along the whole line on one spot, and the shooting of the individual must be better. Wide extensions outwards and gaps in the

firing line do little harm also in the attack, and the less so the further one is from the enemy. Thin firing lines are, as a rule, in spite of this, able to prevent counter-attack. Besides this, the counter-attack or sortie will nearly always be more dangerous for him who carries it out than for him against whom it is made, even when it is successful Individual leading will naturally be still more than ever the chief duty of subordinate leaders. But in cases where infantry fire is heavy, the leading of large bodies across open country will become almost or completely an impossibility.

The various points where cover is obtainable will soon be separated from each other by impassable stretches of ground. The firing line will frequently be consumed up to these points, and the groups standing there will be left to themselves. If troops are not accustomed to these conditions in time of peace, they will not know how to act with intelligence under service conditions.

The circumstance that weak firing lines can rarely be broken through from the front even by superior numbers, would make it in most cases all the more advantageous, when advancing over open country, to merely hold the enemy in front, and to make use of the surplus in strength on the wings, where a concentrated fire, can usually alone accomplish favourable results. Only in those cases where the country favours the advance will the opponent be so nearly approached as to render possible a real frontal success by fire at close ranges. In other cases the frontal attack will have to be delayed until the turning movement has commenced to make itself felt. Forcing the pace would in these cases generally mean a waste of strength and leave the matter in doubt into the bargain. The very non-assailability of thin lines in front is, in my opinion, just as much an advantage to the attacker as to the defender, and admits of his gaining successes against equal and superior forces which are less extended.

But only employ so many men in a firing line at a time as can lie down next one another without impeding each other's movements. Even this firing line will be broken by many gaps; moreover, in real warfare over open country, supports in rear will only have a limited value. Therefore, I believe, we shall have to give our various formations and bodies of troops, at least as long as they are of full strength, greater breadth and less depth than we have been in the habit of doing. The nearer one approaches one's opponent, and the more complete his envelopment, the more defenceless will he become in his central position.

In the battles of the future, the fronts of which may extend for miles, concentrated fire will naturally not be able to make itself so felt in the beginning as was the case in the small plateau of Spion Kop. But on the wings or on the exposed flanks, points, as a rule, must

present themselves which can be seized from more sides than one, and it is at these points where initial success should be sought for. The latter are, as a rule, the most difficult to defend, and, with our modern weapons, their capture soon leads to the breaking up of the whole fighting line; if one may judge from South African conditions. I would like to remark that this holds good in British formations with reserves, and further, that the extent of front occupied in South Africa frequently varied from 25 to 30 and even 45 kilometres, and so far can bear comparison with European conditions. In most cases the enemy must be surrounded, even if only by a thin ring in one or more places, and this ring must be gradually drawn tighter. This is chiefly the task of the infantry.

The lessons for artillery in this respect in the campaign are as follows: It must accompany the attack with its fire, but may not approach without cover within range of infantry. What has been said above with reference to infantry is still more important in the case of artillery; it will thereby soon be annihilated before its fire becomes of any effect. When cover is obtainable it is quite another matter. In such positions the English artillery has been several times unable to fire a shot, or, at any rate, more than two or three.

If we cannot keep down our opponents completely by means of artillery, I recommend the advance of the infantry being made in the following manner, which is pretty well in accord with the spirit of our regulations:—

The infantry attack can only be commenced where it can be more or less concealed by the lie of the ground. When this is not the case we must wait for darkness. By day the preliminary movements will have to do with getting cover, if only from view, so as to keep the enemy in uncertainty as long as possible. The extension outwards of the various attacking groups should not exceed the breadth of the cover in front, rather several lines behind one another. The troops nearest the front will have to seize tactical points from time to time, under the protection of which the others can advance. Moreover, especially when under the enemy's fire and over open spaces, forwar l movements can only take place, in my opinion, by creeping as the Boers did, and by rushing forward in small groups. A rush in the case of larger detachments is only feasible when exposure is only for a short time, followed by disappearance. Naturally, every company and every section will in this way be split up into groups creeping and rushing forward, some far in front of the others. The utility of the section and company commanders, when within effective range of the enemy, will generally be limited to rallying their troops under cover, re-organising them and giving instructions for the next advance. Greater claims will have to be made on the independent action

of group leaders, and afterwards on individuals themselves, and if careful preparation be not made beforehand in peace the part played by the latter will scarcely meet with sufficiently satisfactory results.

I am quite aware that the feasibility of doing this will be disputed. I myself had doubts about it two years ago, but I have seen Germans who were in no way superior to our own soldiers making themselves just as *au fait* with this method as the Boers, and that, though their offensive spirit did suffer, it at any rate lasted longer than that of the British with their method. I have also led manifold commandoes on such occasions, and cannot believe that our non-commissioned officers and the better elements amongst the men could not surpass these adventurers, not to mention a trained infantry officer surpassing an untrained one.

Fire in attack at ranges over 1,000 yards is of little value. And where already it is no longer possible at greater distances to come forward without it, it will very soon be in all cases impossible. At this range, or 800 yards, an uninterrupted fire helps the advance considerably if detachments lying down under cover further to the front thereby draw attention to themselves. Such advanced groups I would gradually make as strong as the extent of cover would allow. They will frequently be able to make good use of the spade, for they will often have to wait long in their positions. They ought not, however, to draw the fire of the enemy on themselves until they are strong enough and properly prepared. The knapsacks might perhaps be made use of for head cover against shrapnel; rugs rolled together were, at any rate in South Africa, of great use for the purpose.

As regards the other points, the advance must be carried out just as the Boers did, by means of continuous mutual support by fire. As soon as the last position under cover is reached, or when the country is open, at a range of 800 to 600 yards every possible rifle must be put into the firing line. The latter can at this range rarely be reinforced before darkness; a small outward extension of skirmishing lines on the ground line under cover costs as a rule less than frontal attack over fire-swept plains.

Even in the last period of the attack where firing can be adopted with success, it is advisable for one man or several to creep forward and shoot alternately. It is at this very period that the greatest care is enjoined because the effect of fire at these distances, even at people kneeling, is almost annihilating. A single instance of carelessness may spoil everything. One will seldom succeed in recognising the effect of one's own fire and arriving at the extent of the losses of an opponent lying down. The silencing or weakening of an enemy's fire alone may give rise to one's being deceived, and an error generally revenges itself by defeat. Troops which have here once commenced their final advance will

scarcely again come across another timely stopping-place. A final rush is therefore only made when one has actually ascertained that the defender is flying. I consider it, therefore, to be very dangerous to carry out our peace manœuvres not under service conditions so as to save time, and to rely on things coming right of themselves afterwards in war.

The British have acted in the war just as they had practised in peace-time; the Russians did the same thing at Plevna, and we ourselves in the first half of the French war. But counter-strokes such as at Wörth and Gravelotte may also be attended by more serious consequences than was there the case, unless we have an artillery which is superior to that of 1870-71.

* * * * *

The concluding portions of my observations I would reserve for the cavalry. It is well known that the work performed by the British cavalry, as far as actual fighting and scouting is concerned, was very indifferent, and offers very little that is of interest. Their endeavour to attack with cold steel nearly always failed. I have seen only one successful attack. This was in the fight at Donkerhoek, or, as the British call it, Erste Fabriken.

A thinly-extended line of Boer skirmishers was surprised in flank and rolled up. The tactics of the infantry with comparatively few reserves as proposed by me in the foregoing certainly offers cavalry, especially in the later stages of an engagement, greater chances for such flank attacks. Still, the points of attack are chiefly on the wings, and if we were to retain reserves echeloned in rear, the danger could be effectively dealt with.

Everyone on the Boers' side fought as mounted infantry, and this mode of fighting is perhaps worthy of mention.

It is clear that we cannot make use of our cavalry to carry out the defensive or offensive movements of whole battles in the same way as infantry, as was the case in South Africa, but in certain phases of a fight it can, in my opinion, be made use of dismounted. This is especially the case in advance and rear guard actions and in the pursuit. In the first of these three, its action is chiefly to gain time; and in the second, to disappear at the right moment.

In advance-guard engagements, a line of skirmishers, no matter how thin it be, can as a rule delay an opponent for a considerable time, if the latter is unable to see what lies behind it. But this he will not usually be able to do as long as he is unable to outflank the position. In such a situation, therefore, the most important step is to occupy a large stretch of country, thus making a turning movement difficult; and the second step is to strengthen the forces occupying it. Large gaps between weak independent groups of skirmishers do no damage even in this case. The opponent will, as a rule, hesitate to make a frontal advance in spite of

this. For owing to the invisibility of these shots and the rapidity of magazine fire, he will usually over-estimate the numbers of the cavalry.

But if the enemy enters on a frontal attack with rapidity he will, as a rule, pay for his attempt, and even if a success be obtained it would be out of proportion to the cost. A few Boer skirmishers divided along a front of 5 or 6 kilometres, have often compelled cavalry divisions of the British to make a protracted halt. The chief conditions are to take care that the weakness of the detachment is not found out, that difficulties are placed in the way of a turning movement, and that the horses are not kept too far away from the skirmishers. 100 to 200 yards is, however, not too far. The retreat takes place naturally in widely open order. The same may be said with regard to rear-guard actions, only in this case resistance must usually be more prolonged, and therefore the skirmishing line must be that much denser. In such cases one must remain lying down much longer than when acting as advance-guard, since in retreat the position of the infantry is generally much more difficult. For the rapidity of the retreat of the rear-guard depends on the marching powers of the infantry, whilst the rapidity of the enemy's pursuit depends on the marching powers of his artillery. There is, therefore, danger in a retreat of being so pressed as to be no longer able to take up another position and so one must sacrifice one's artillery in order to allow the infantry time to get away.

Dismounted cavalry is, on the contrary, much better able to avoid such dangers. To make their tactics successful, however, they must be skilled in the use of their rifles and in the occupation of ground. The Boers allowed the British skirmishers to come within 400 or even 300 yards of their kopjes, and nearly always managed to get away without great losses. Their horses, as a rule, were in position 100 to 150 yards in rear. Our country, indeed, rarely offers such favourable positions as the kopjes; still, I have seen woods and buildings bring about the same results. The latter are far more numerous with us than with them.

Regarding the tactics of cavalry in pursuit, I would like to take the Boers as a pattern in certain respects. They accompanied a wavering opponent by moving mounted, parallel to his flank, dismounting at favourable positions, and deluging him with fire without actually attacking him. This accomplished the discomfiture of the British just as effectively as if they had attacked them. They suffered considerable losses on every occasion, whilst the Boers suffered none.

The endeavours of the British cavalry to mingle in the pursuit failed, as far as I know, every time, and often a handful of men and a few cartridges caused large masses of cavalry to retire, as was the case at Machadodorp, where only a few dozen Germans and Boers, who had nearly expended their ammunition, had taken up a position.

Concerning the action of cavalry against cavalry, the war offers examples only in so far that when the Boers met British cavalry they dismounted and fired. The horses on such occasions stood immediately behind the firers. This method was not only adopted for the purpose of repulsing an attack over open ground, but they even advanced to within 500 or 600 yards of the British, then dismounted and fired. As far as I know, the British cavalry were unable to do anything against this fire. Still, I do not desire to give these as examples of the inefficiency of the British cavalry without further opportunities of making a comparison.

The last point which seemed to me of interest deals with mounted patrols, a duty of cavalry which is the most frequent and most dangerous on the battle-field. I feel sure that the cavalry soldier can rarely find out what is lurking in a farm, village, or bush as long as he stays on horseback. It is easy for two or three men armed with magazine rifles, and hidden in the neighbourhood, to allow mounted men of ten times their number to approach so close to them as to be able to fire at them in a body, and cause those who are not hit to bolt for all they are worth without having seen anything.

Even when patrols in the execution of such reconnaissances open out into broad lines, the individual rider offers such an excellent target that such reconnaissance, though it may be successful, will as a rule prove too costly. Let alone the fact that such manœuvres can often only be imperfectly carried out owing to the nature of the country, at least so far as one can judge by the average amount of use rendered by the mounted men. To be able to properly approach such objects, and find out what is therein contained, the patrol must dismount and creep forward. This is best done from several sides. Such a method is naturally all the more to be adopted if it is necessary that the object aimed at be taken possession of, and the latter will frequently be the case, when it is intended to move further to the front.

The numbers also of such patrols are, in my opinion, very important, if such places are to be seized. To carry out such measures from several sides with success every detachment must at least be four or five carbineers strong, otherwise it will not be able to stand the loss of one or two men. To these must be added men to hold the horses, and a couple of carbineers for their protection. For the above reasons I think that where it is intended that patrols should really go far forward and penetrate the veil of the enemy's outposts and patrols, they should be at least 15 men strong. But it is better, as with the Boers, to employ from 25 to 30.

A few strong patrols frequently see more than a number of weak ones. If the leader wishes to advance with a few men he can do so

always, leaving the remainder hidden in rear. The English patrols, which advanced far to the front, were as a rule five or seven men strong. The smallness of this number, and the habit of always remaining mounted, caused them to retire whenever they met with the least resistance. They were frequently completely destroyed by two or three men, or even by one at very close range, or they were repulsed with such loss that they could not do more than report having been fired on. Accordingly, such patrols were of little use. The consequence was the uncertainty in which the English leaders were situated from beginning to end, and the manifold surprises which they sustained in consequence. An essential element in a patrol is the possession of good glasses. They are, in my opinion, just as important for such duties as they are for artillery.

In case one should think that the reconnaissance of the Boers was excellent, this was by no means the case. Good as the Boers were in concealing their movements, the reconnaissance of the enemy by means of patrols was practically *nil*, no matter how much circumstances were favourable to it. The reason lay in the lack of courage among the Boers, which was apparent here as everywhere else.

Patrol duty entails, in my experience, greater demands on self-control and tact than anything else, just because the temptation to expose oneself is great, and because those in front must minutely examine every piece of cover, even if the same might suggest the possibility of being a death-trap. The Boers were lacking in these qualities, and the want was so apparent that the Boer generals, in the course of the war, assigned the reconnaissance duties to the hands of the foreigners. Although the Boer knowledge of locality, their eye for country, and on occasions their skill, were superior to our own, we always brought in the better reports. From this one can see the value of moral qualities. I took charge of the initial reconnaissance of General Botha's army, operating to the east of Pretoria for about six weeks with a small troop of 25 men, and during the greater portion of this time moved about close to and between the detachments of the British.

As regard patrolling by night: to halt a large patrol in a hidden position in front, and from this to send out smaller patrols is better than to allow independent patrols to ride about all over the place. One will generally be safe at night in a small bush or small farm of two or three buildings, unless the enemy has got exact information of one's whereabouts An opponent will rarely attack anything in the darkness, of which he is uncertain, if he is fired at.

The value of horses is so great that they should be spared in every possible way, and they should have a bridle which would admit of the

bits being removed and inserted by a single movement—the British had such things.

For fighting on foot, the cavalry soldier requires, no doubt, a lot more cartridges, best done up in cartridge-belts, of which we often carried two or three without inconvenience. Further, we have ridden for days with the Mauser rifle slung across our shoulders, without experiencing any annoyance. The weapon must be across the bandolier, and the knob must not point inwards. Manipulation is very easy, when carried in this manner. Even the artillery was armed in this way, and I observed no disadvantageous results. But for officers I would recommend Mauser pistols, or some such weapons.

In conclusion, I have to apologise if my views have been expressed with too great exactitude. This was not expressly my intention, but know no other method by which I can escape being misunderstood.

G.

THE BLOCKHOUSE SYSTEM IN SOUTH AFRICA.[1]

By Lieut.-Colonel R. M. HOLDEN,
Secretary, Royal United Service Institution.

THE blockhouse system, which is playing such an important part in the second phase of the war in South Africa, is not, as is generally supposed, the product of the last two years. We read of it in the suppression of the rising in the Highlands of Scotland in 1745, when the Duke of Cumberland erected blockhouses, half-a-mile apart, stretching

1.—ERECTING AN IRON BLOCKHOUSE.

from Inverness to Inverary. A similar system was employed by General Dalrymple for the reduction of the Caribs, and the protection of the British settlers in the Island of St. Vincent, in the West Indies, in 1772-73. The Russians erected blockhouses of wood in Circassia during the conquest of the Caucasus, which began in 1813, a campaign which, in many respects, resembled the present one in South Africa. These

[1] The four illustrations describing the erection of a blockhouse are reproduced through the courtesy of the Proprietors of *The Graphic*. We are indebted to the *Royal Engineers Journal* for Nos. 5, 6, 8, and 10. The remainder are from photographs taken in South Africa by the writer of this article and by Lieutenant L. J. N. Neville, R.E., and others. The maps have been supplied by the Intelligence Division of the War Office.

blockhouses, which were built on the plan designed by General Vorontzoff, were of wood, with a look-out above and a place for the horses below. They formed a continuous line of fortifications, and the area bound was continuously contracted by the building of new lines of blockhouses, thus narrowing the field of operations of the enemy, who were practically exterminated in the end.

Monk's campaign in the Scottish Highlands in 1754, etc., Cornwallis's campaign in South Carolina during the war of American Independence, Hoche's in La Vendée, the guerilla fighting in the Franco-German War of 1870-71, and in the Spanish-American War, and the operations of the French under Marshal Bugeaud in Algeria, all contain much of interest to any in search of conditions more or less similar to those under which our troops are now engaged in South Africa. Marshal Bugeaud was strongly

2.—Erecting an Iron Blockhouse.

opposed to the multiplication of permanent posts; and it is not difficult to conceive conditions under which they are doomed to failure—as, for instance, when they become weak by reason of their numbers, do not secure communication, and have no effect upon the country. The system was carried to extremes in the Cuban insurrection of 1898, in which the failure of the Spanish is attributed, to a great extent, to their trenches and blockhouses. Their trocha or trench was a passage-way made across the country without regard to its topography or its other roads. The idea was first conceived in the Cuban insurrection of 1868-78 as a military cordon across the island, with detached garrisoned forts at short intervals, its purpose being to hem in the insurrectionists and confine them to a limited region of the island—a purpose in which it signally failed. It was this trocha upon which Weyler depended to cut the rebel army in two and shut up Maceo. In constructing this military line the forest and

dense underbush were cut down through a width of from one hundred to eight hundred yards. Along this passage a barbed-wire fence nearly four feet high was erected, behind which the sentries were posted. Forty yards further back were the loghouses, which served as quarters for the troops. These were built at intervals at from 500 to 800 yards, and were constructed of logs with dressed lumber on the outside. A narrow opening ran round the fort to permit firing, and near the top was an opening three feet wide to admit the air. The forts along the trocha were of three kinds and sizes—large ones half a-mile apart, smaller blockhouses mid-way between these, and in each of the quarter-mile intervals three little forts of mud and planks, each surrounded by a ditch and holding five men. The barbed-wire was closely interlaced, there being over four hundred yards of wire to every twelve yards of posts.

3.—Erecting an Iron Blockhouse.

The Spaniards also distributed bombs along the trocha, each with an explosive cap, to which five or six wires were attached, so that they might be exploded by anyone striking a wire.

The second measure on which the Spanish relied were their forts or blockhouses, different, however to those already described. These blockhouses covered the whole island of Cuba, which is 800 miles long and 80 miles in width; some were in straight lines, some in circles, and some zig-zagging from hill-top to hill-top; some within a quarter of a mile of the next, and others so near that the sentries could toss a cartridge from one to the other. The blockhouses were bullet-proof and loop-holed. They stood upon every commanding place and formed a feature in the landscape hardly second to the characteristic palm. Bodies of guerillas and columns of troops left the forts periodically, but they returned to their strongholds every evening, not considering it sound policy to

pursue a flying enemy. Within their trocha and their forts, their fortified towns and their cities, the Spanish held possession. Outside them—that is, in all the rest of the country—the Cubans were masters of the situation. It is small wonder therefore that the trench and blockhouse system altogether failed in this war. For three years an army of more than three hundred thousand regulars, with a contingent force of some sixty thousand volunteers, was held at bay by a body of insurgents certainly never numbering over fifty thousand, and most of the time in all probability far below that number.

Lord Kitchener's scheme in South Africa is more sound. It contemplates making his long line of railway communications absolutely secure. By relieving as many men as possible from the important duty of guarding the railways, he increases the number of men available for

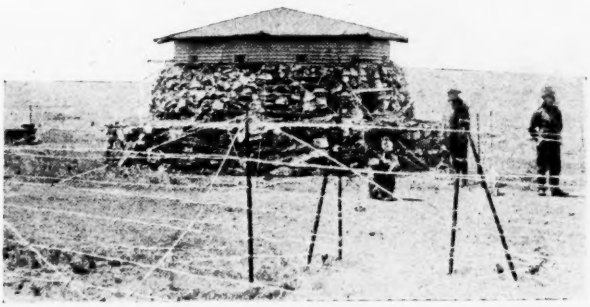
4.—Erecting an Iron Blockhouse.

mobile columns in the field; and with these columns he operates against the scattered bands of the enemy, and completes the exhaustion of their resources, sometimes driving the Boer commandoes into the arms of our own columns and at others pushing them against the blockhouse lines. The blockhouse system is quickly spreading over the country, enclosing areas which are gradually cleared by the mobile columns and are then occupied by a network of constabulary posts.

A blockhouse, in the ordinary sense, is a small fortified, defensible, loop-holed, guard-house or barrack, suited chiefly to mountain warfare in wooded country where it is not always easy to bring artillery to bear upon it, and the artillery itself is of inferior power. More frequently, perhaps, it is used as a keep or place of final defence in a field work. It has framed or stockaded walls and roofs formed of timber or iron rails, with well-rammed earth on the top, and is capable of rapid construction.

It will be seen by the accompanying maps that, as a rule, the blockhouses in South Africa follow the line of railway, thus guarding the lines of communication; but they are also to be seen quite apart from the railway, as, for instance, near bridges, on kopjes and ridges commanding towns, and at entrances to towns, as at Colesberg in Cape Colony, and in the middle of towns, as at Beaufort West and Victoria West in the same Colony. And, finally, there is the ox-wagon blockhouse, used for the protection of convoys, shown in illustration No. 8.

The importance of the railway cannot be overestimated. It would have been impossible, without it, to have taken an army into the Orange River Colony or into the Transvaal. The Boers thoroughly appreciated its value, and have done their best to destroy it. The Royal Engineers have repaired no fewer than 25 bridges with a span of between 100 and 500 feet, 20 bridges with a span of 60 feet, and 180 culverts with a span of 6 feet to 20 feet, all of which had been destroyed by the Boers. They



5.—Octagonal Iron Blockhouse, Reitfontein.

have laid as much as ten miles of new lines round the bridges which had been destroyed. But the Boers have not only destroyed the bridges and pulled up the line; they have blown up forty-five of our rather shaky locomotives. The blockhouses, aided by the armoured trains, have caused an almost complete cessation of these destructive methods which were so frequent in the early and middle periods of the war.

The blockhouses in South Africa are of two kinds, corrugated iron or stout masonry. The former were designed by Major S. R. Rice, Royal Engineers, who had been C.R.E. in Ladysmith during the siege, and was responsible for so many of its later defences. The iron blockhouses are octagonal, hexagonal, or circular, and loop-holed, but the original idea has been so experimented upon that they are now found in a great variety of shapes. The circular kind are generally preferred; they certainly take less material, which is a consideration when some four to five

thousand are in course of construction. The general principle is, however, the same in all. Blockhouses are rapidly built, taking twelve men and twenty natives only about eight hours to erect. In addition to being serviceable they have the merit of being cheap, their cost ranging from £50 to £70 each. They are made by placing two sheets of corrugated iron a few inches apart, and filling the intervening space with gravel. The first patterns of roofs made were gable-shaped and heavy; these have now been superseded by umbrella-pattern roofs with very light principals. The all-round slit up above shown in illustration No. 6 is higher than the level of the heads of men inside, and is intended for a sentry to look out of by standing on ammunition boxes.

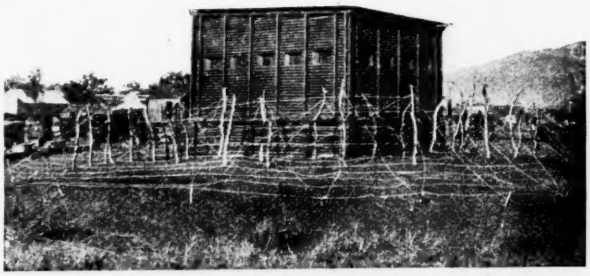
The walls of these blockhouses have been proved to be bullet-proof, but are not impervious to larger projectiles. At first they were found

6.—Hexagonal Iron Blockhouse, Kaalfontein.

sufficient to keep off any of the lesser attacks of the train-wreckers, and the Boers fought shy of them. Then the Boers devised a means of attack: with unprecedented boldness they stole up to the very loop-holes and used them against the defenders inside. In this manner several blockhouses were captured, and it looked as if the system would have to be abandoned, but the ingenuity of the Royal Engineers came to the rescue, and each blockhouse, in addition to a barbed-wire entanglement, is now provided with a complete lace-work or spider's web of wire environment, so interwoven that it is cutter-proof. This absolutely prevents the enemy from repeating his daring tactics of manning the loop-holes from the outside.

The blockhouses made of stout masonry cost from £200 to £600 each. They are very substantial erections, generally used for the protection of bridges and other salients. They are frequently met with on either side of an important river; illustration No. 11 describes those erected on either side of the bridge over the Orange River at Norval's

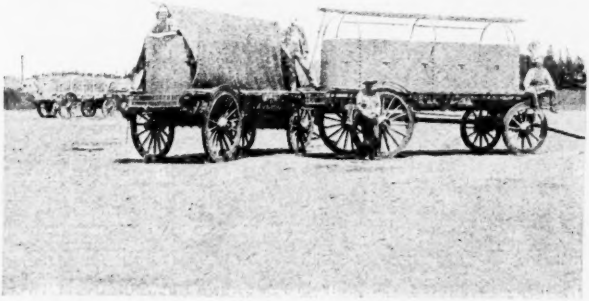
Pont. These buildings are made on a principle similar to that employed with the Police and Frontier Militia posts on the Samana and other portions of the North-West Frontier of India. They have more than one storey, and entrance is obtainable only with the aid of ladders, which can be raised from the inside. There is a gallery or parapet projecting



7.—Iron Blockhouse, Barberton.

from the upper part of the wall, supported by brackets with apertures in the lower part through which the garrison can fire on those below.

The ordinary iron blockhouse has a garrison of one non-commissioned officer and six men, although capable of holding more. The life, though dull and monotonous, is not at all disliked by the men, as it is free and



8.—Ox-Wagon Iron Blockhouse for protecting Convoys.

open and unattended by regimental duties and worries. But the strain of night duty, and the labour of constructing fences, and other obstacles, falls heavily on these small garrisons, and Lord Kitchener has already borne testimony to their cheerful and willing spirit. The average garrison may be put down as about ten, so that the 5,000 blockhouses will monopolise some 50,000 men, so severe a drain on the force

in the country that Lord Kitchener contemplates reducing the number of men to possibly four in each blockhouse. Inside of each blockhouse is a cistern of water, and reserve rations for a week. The garrison of the blockhouses on the railway line is supplemented by natives, who sleep outside, and also by two or more dogs, which are a very useful adjunct to the sentry by giving audible warning of any approach. A favourite device of the soldiers is to place a dummy sentinel outside to attract Boer bullets. The men have strict orders to fire at any moving object, man or beast, after dark. Stray horses, cattle, and ostriches have consequently frequently paid with their lives for their temerity.

The distance between blockhouses varies from a quarter of a mile in the case of those between Pretoria and Komati Poort, to 3,000 yards

9.—Picturesque Iron Blockhouse, near Colesberg.

at other places. Between the blockhouses on the railway line are stretched strands of barbed wire, hung with spring guns, bells, rattles, and other automatic alarms. The spruits, etc., are also protected by barbed wire entanglement. The wire can, of course, be cut, but it is a slow process, and, consequently, a dangerous one. Between every two blockhouses the wire line bends outwards to an angle, so that in firing down the line the blockhouses do not fire into each other. And along the entanglement to within 100 yards of each blockhouse a deep trench is dug which prevents wagons ever getting across, even if the wire is cut. The Boers themselves escape through these lines when a drive is in progress, and frequently make the passage on dark, windy nights, when it is most difficult to hear the wire being tampered with. On such occasions one man will crawl up and cut all the wires, and if the spring-guns and alarm bells go off he will lie quiet in the trench until the block-

houses are tired of shooting, when he will crawl back to his comrades and lead them to the gap he has made.

10.—RECTANGULAR MASONRY BLOCKHOUSE, TAAIBOSCH SPRUIT BRIDGE, O.R.C.

The blockhouse garrisons have tried many ingenious expedients for frustrating these night attempts, one of the latest being a "flare" at each angle of the wire entanglement. This consists of a biscuit tin, filled with rags and tow, soaked in petroleum, which on the alarm being given

11.—MASONRY BLOCKHOUSE, NORVAL'S PONT BRIDGE.

is lighted by pulling a wire in the blockhouse. These flares burn for about half an hour with a brilliant light. An attempt is also being made to work a system of lamps at the wire lines, so that anyone approaching them after dark can be detected.

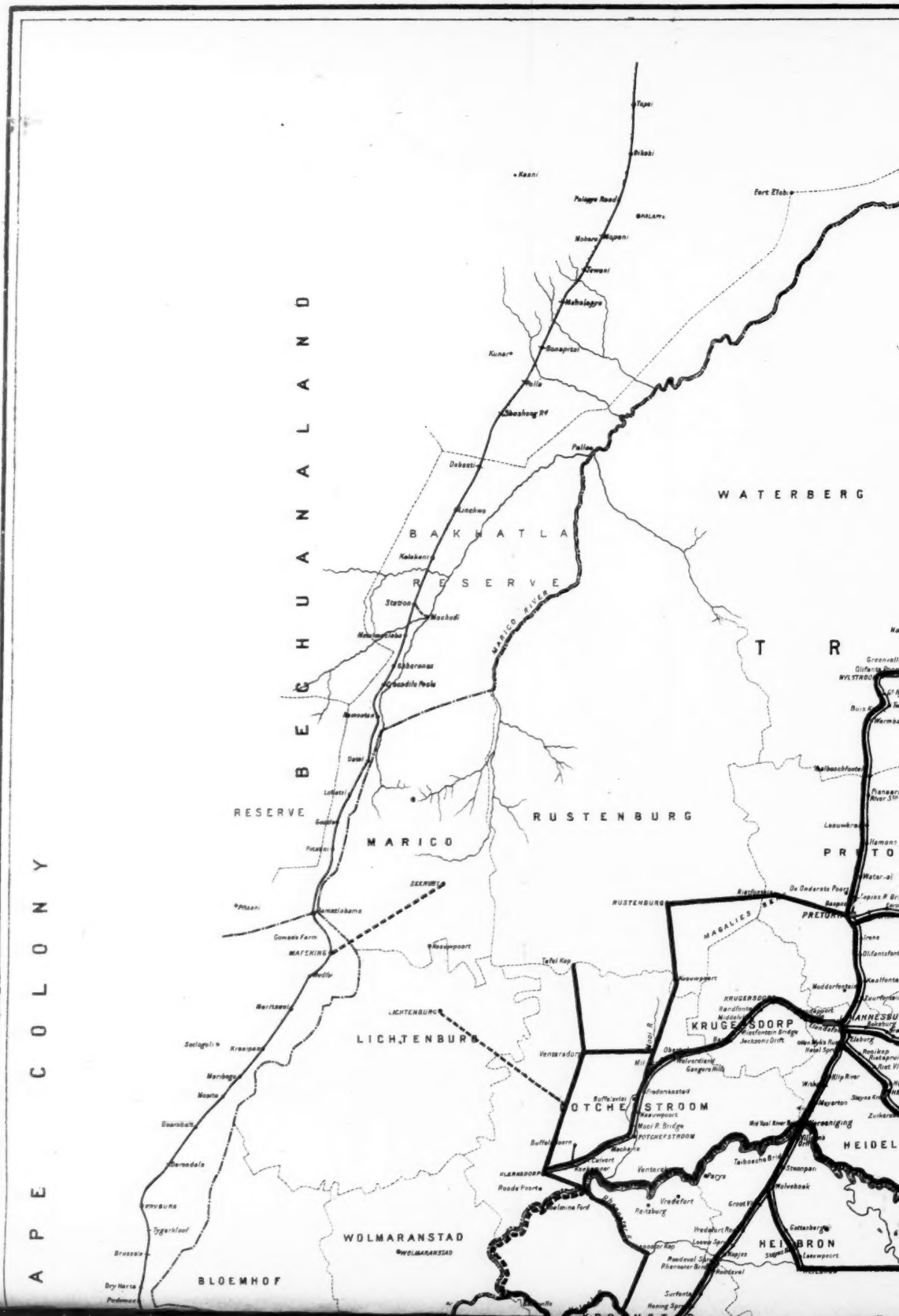
Not an uncommon device of the Boers is to drive herds of cattle and horses against the wire fences in the dark, and in the confusion scramble through. De Wet adopted this method with success when he broke through the Kroonstad-Lindley line on 6th February last during Lord Kitchener's first great drive.

Telephonic communication is maintained between the blockhouses and important stations, and with columns, etc. Constant patrolling goes on by day, while a further and valuable support exists in the armoured trains. There are now more than twenty of these always patrolling the immense length of communications. It is so arranged that if any

12.—Interior of Masonry Blockhouse, Norval's Pont Bridge.

particular section of the railway is unduly threatened, five or six armoured trains can be concentrated upon the threatened point. The duties of these trains consist in patrolling between blockhouses, escorting trains to their destinations, and, in the event of attempted hostile crossing of the railway, forming a mobile support to the stationary blockhouses.

The blockhouse system has given ample proof of its value in South Africa, but it is to some extent handicapped by the failure of the wire entanglement to altogether stop the enemy. Even uncuttable wire is of little avail against a rush of cattle and horses, and it is doubtful if anything short of field mines between the blockhouses will ever render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BLOEMHOF
MAFEKING
RUSTENBURG
PRETORIA
KRUGERSDORP
POTCHEFSTROOM
HEIDELBERG
Tapar
Shoshi
Kasani
Fort Etheli
Palapye Road
Mahalapye
Bonaparte
Kuruman
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Lobatsi
Dabeetsi
Lenchwe
Kolobeng
Mochudi
Crocodile Pools
Ramoutsa
Zeerust
Lehatti
Setlagoli
Kraaipan
Moriting
Moorie
Ottoshoop
Vryburg
Brussels
Dry Harts
Pudimoe
Pitsani
Gamtlabama
Gomas Farm
Rooiwalpoort
Tafel Kop
Modder
Maritzani
Sekameng
Ventersdorp
Buffelsvlei
Potchefstroom
Klerksdorp
Roode Poort
Wolmaransstad
Bloemhof
Vredefort
Rensburg
Heidelberg
Cottenberg
Vereeniging
Meyerton
Zuikerbosch
Taaibosch Bridge
Wolvehoek
Stoompan
Lesuwerport
Rondeval
Phenoster Bridge
Honing Spruit
Surfontein
Calvert
Koedoesnek
Mooi R. Bridge
Mooi R.
Vaal R.
Mid Vaal River
Klip River
Jackson's Drift
Gangora Hills
Witwatersrand
Hartebeestfontein
Middelfontein
Randfontein
Krugersdorp
Hekpoort
Magaliesberg
Tafelkop
Krauwpoort
Olifantsfontein
Kaalfontein
Zwartkop
Hammanskraal
Rietvlei
Pienaars River
Greenvalley
Wylstroom
Warmbad
Waterval
Lepelfontein
Hartebeestfontein
Lesuwkraal
Hamont
Onderste Poort
Bapsfontein
Irene
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Zuikerbosch
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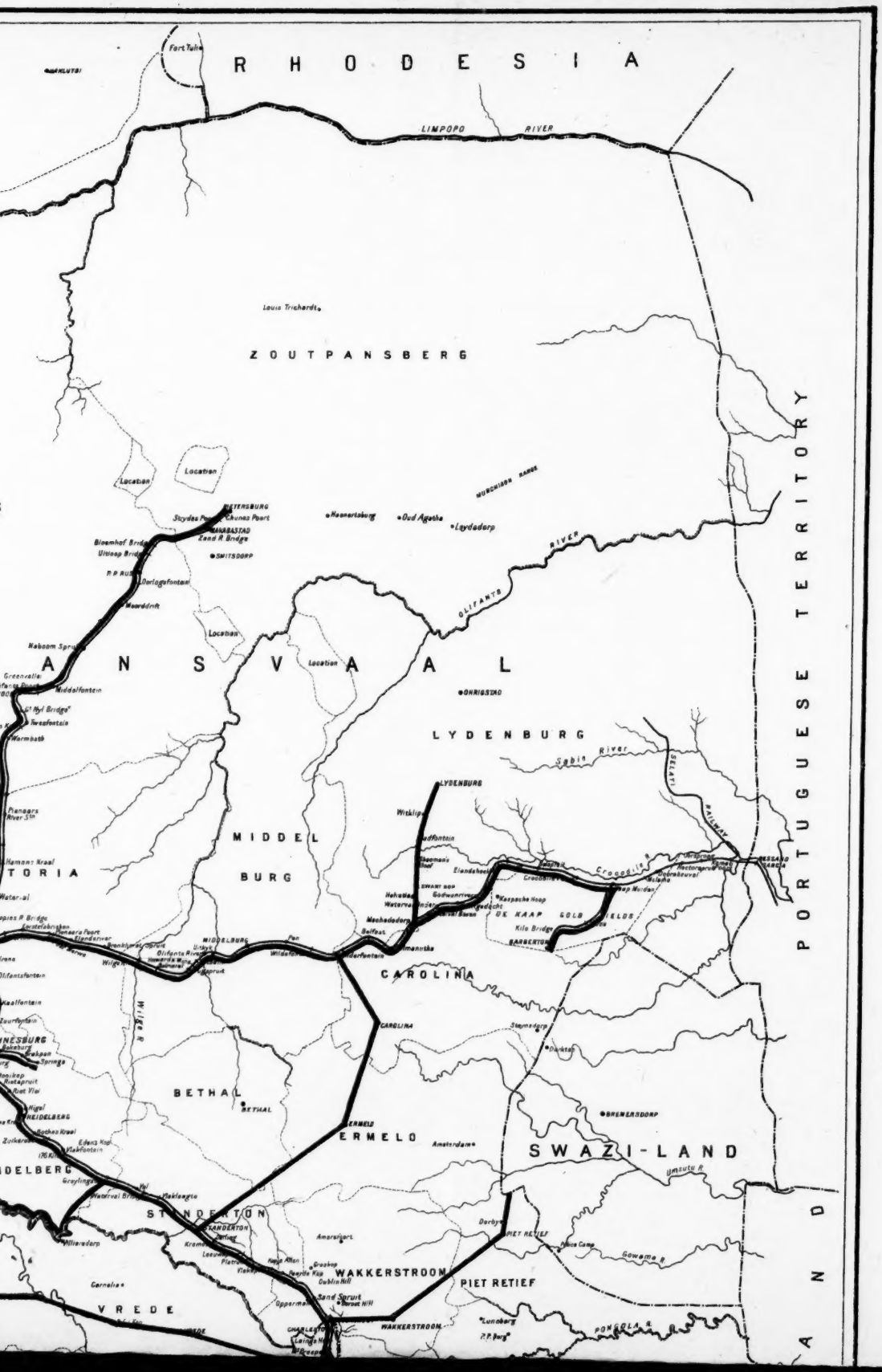
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MURCHISON RANGE
Bloemhof Bridge
Ulitoop Bridge
Zand R. Bridge
SMITSDORP
Doriogsfontein
Location
OLIFANTS RIVER
Location
ONRUST
LYDENBURG
Sabie River
SELATI RAILWAY
LYDENBURG
Witkliip
Middelburg
Eland's River
Crocodile River
Kaapsche Hoop
DE KAAP GOLD FIELDS
Kilo Bridge
BARBERTON
MIDDELBURG
Belfast
Machadodorp
CAROLINA
Stamsdorp
Dantzig
BETHAL
ERMELO
Amsterdam
BREMERSDORP
SWAZI-LAND
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WAKKERSTROOM
PIET RETIEF
Sand Spruit
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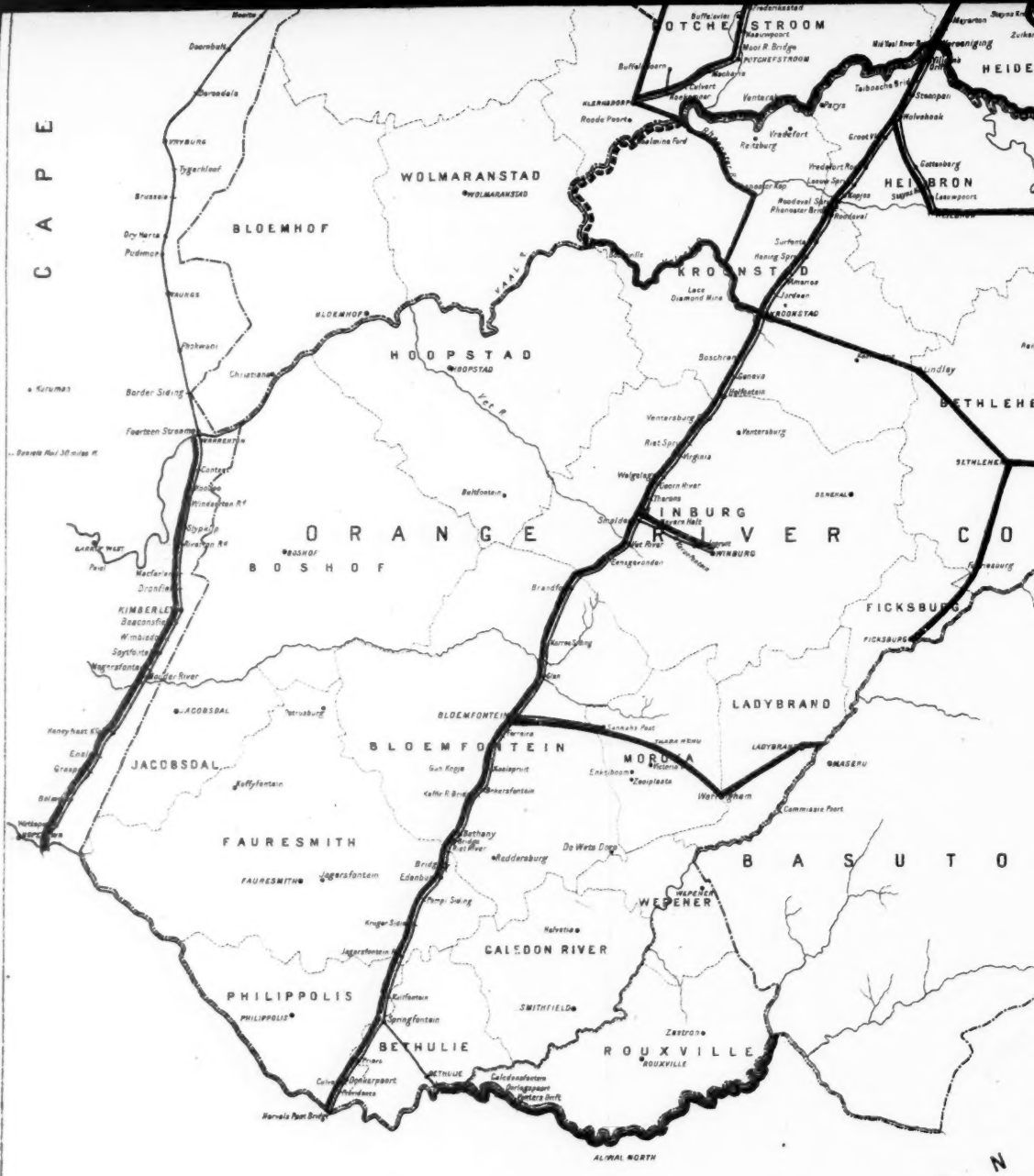
Lunsberg
PORTUGUESE TERRITORY



I.D.W.O. No 1550(a)
(Special issue)

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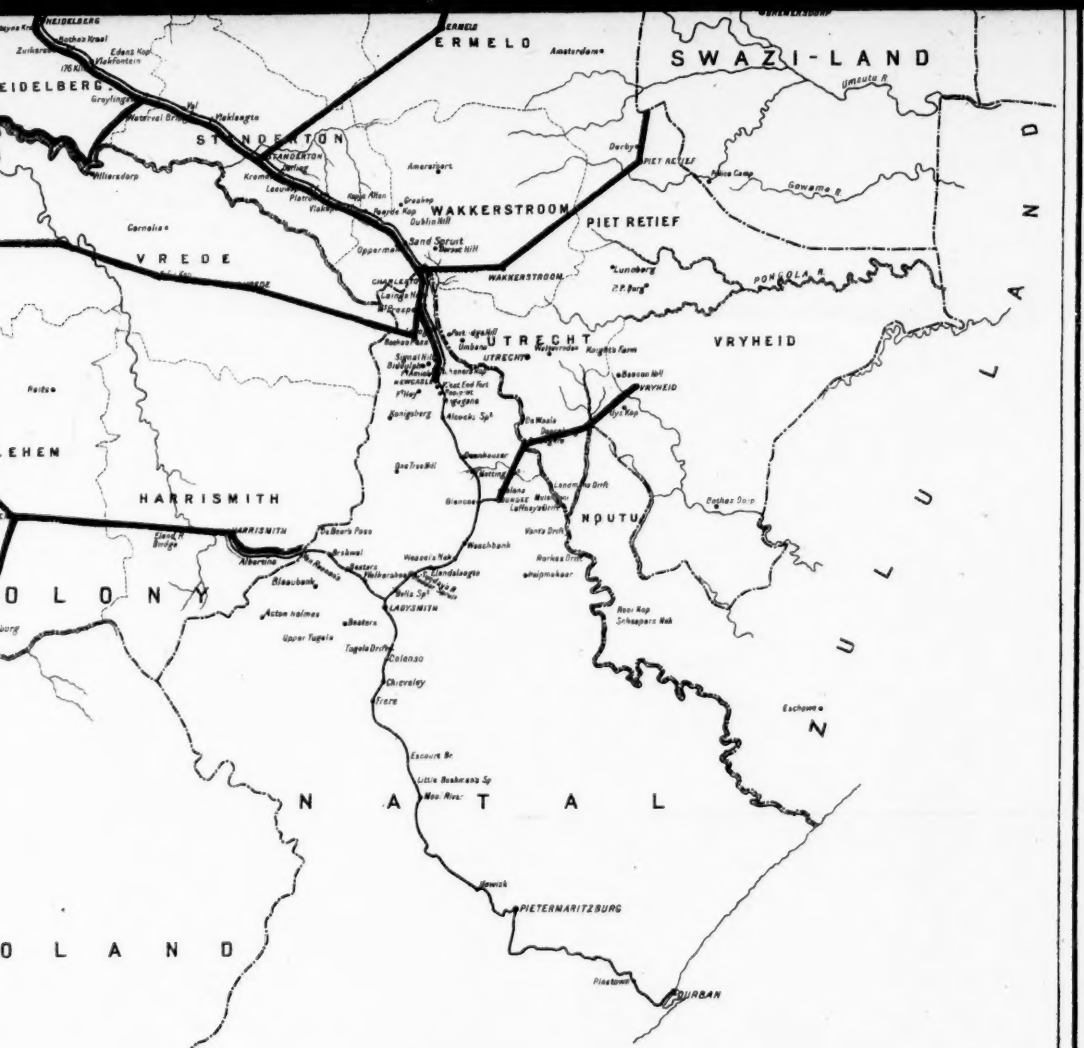


Skeleton Map of

S. AFRICA

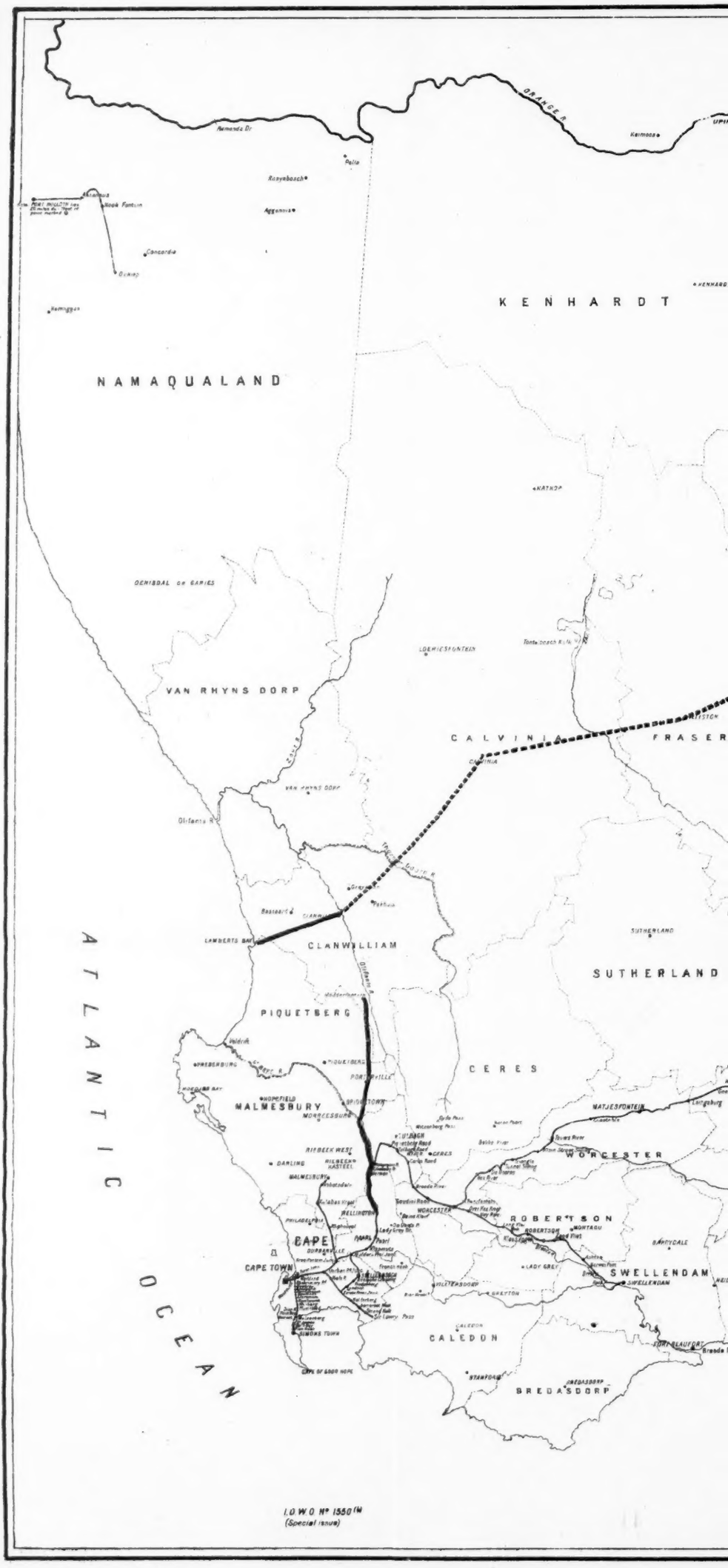
(NORTHERN SECTION)

SHEWING THE BLOCKHOUSE LINES UP TO FEB. 1ST 1902.

SCALE 1/2,112,000 OR 1 INCH = 20 MILES

20 15 10 5 0 20 40 60 80 100 Eng. Miles

Zincographed at the Intell. Div.n War Office, 1902



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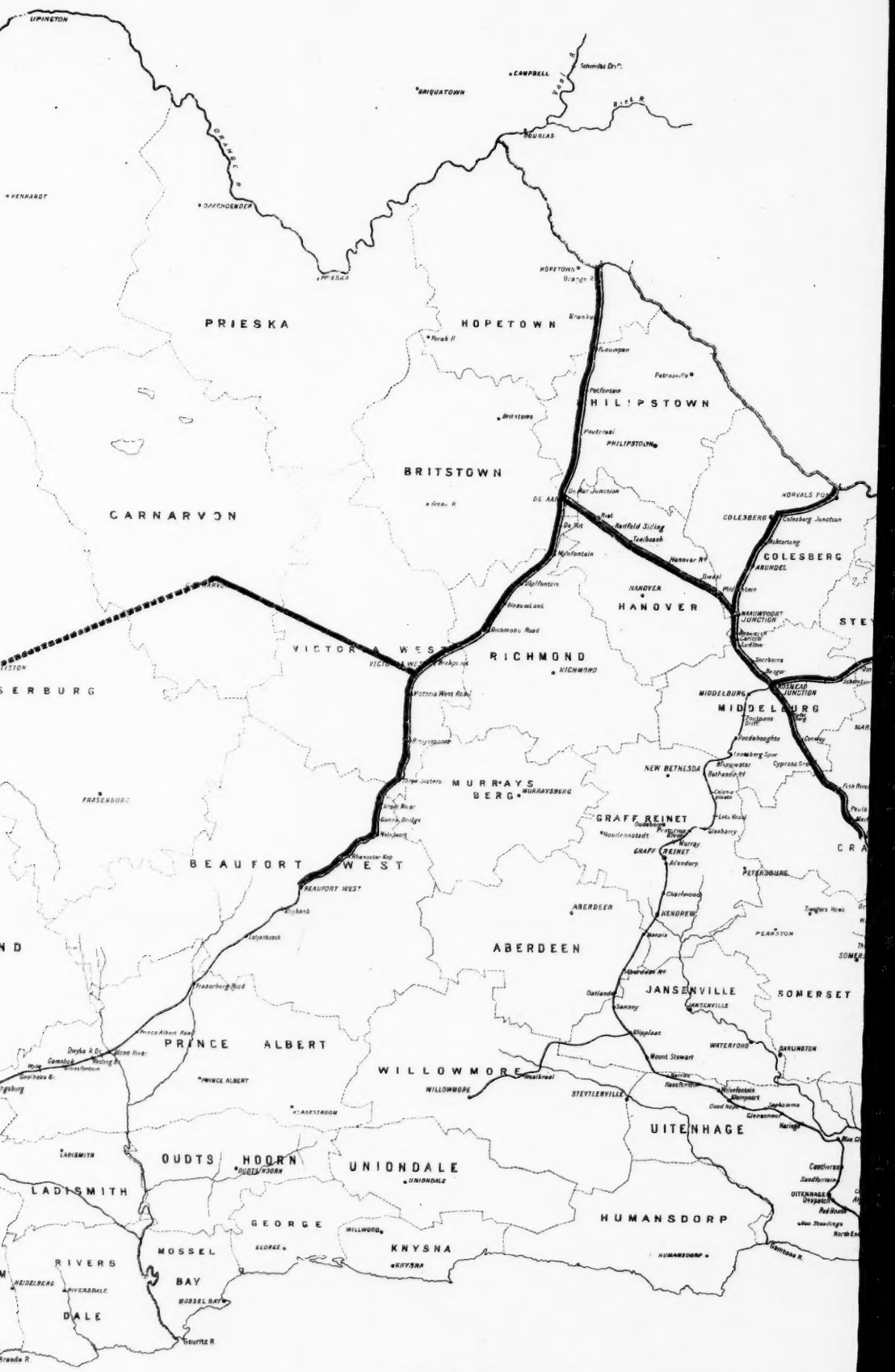
J. J. Kelliher & Co. Ltd. Litho. London.



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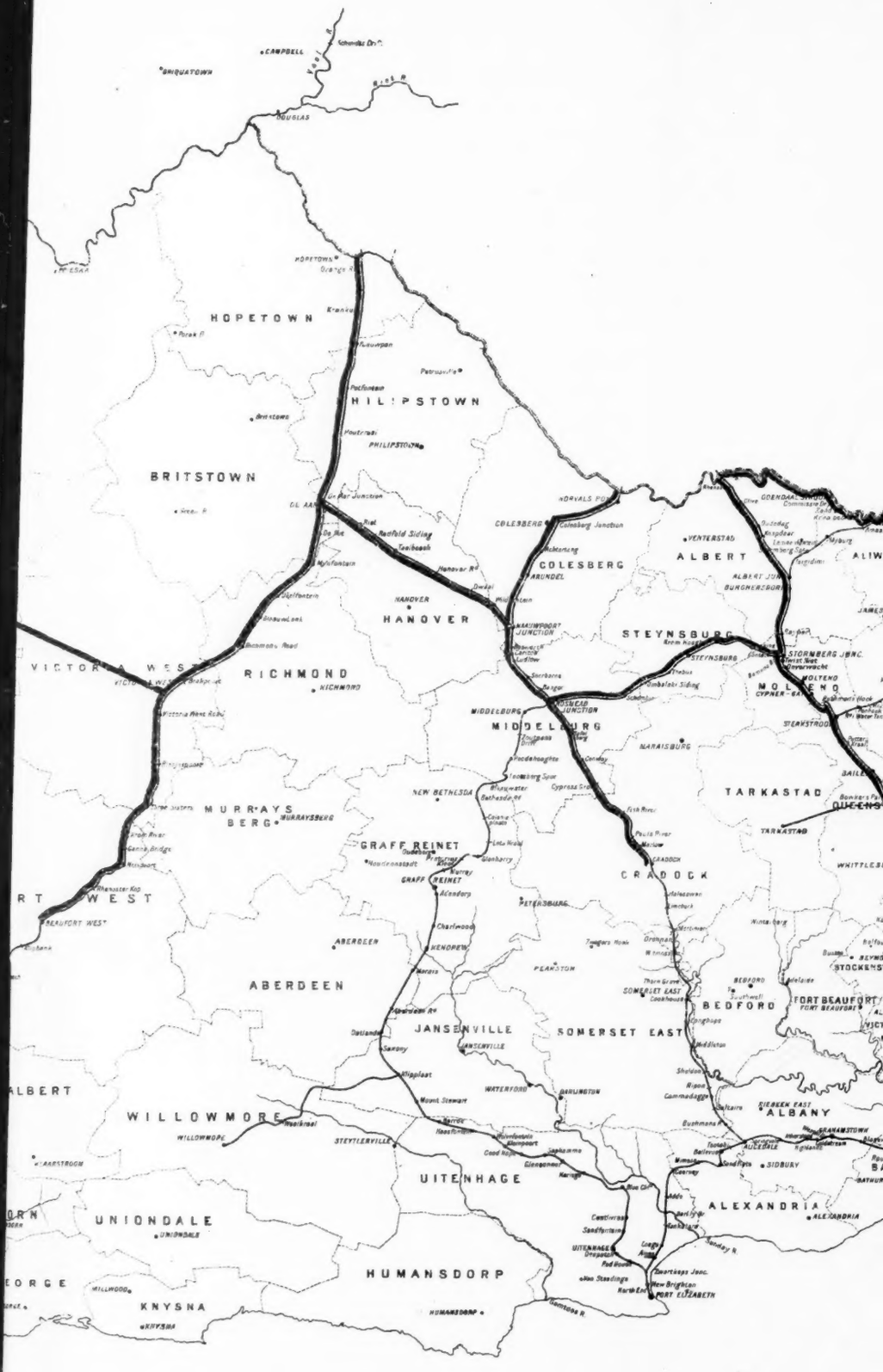
Line of Blockhouses existing.....

.....Do.....under construction.....



NOTE:-The Line of Blockhouses is not necessarily shown on the side of the Railway they exist.

Line of Blockhouses existing.....

Do. under construction.....

Skeleton Map of

S. AFRICA

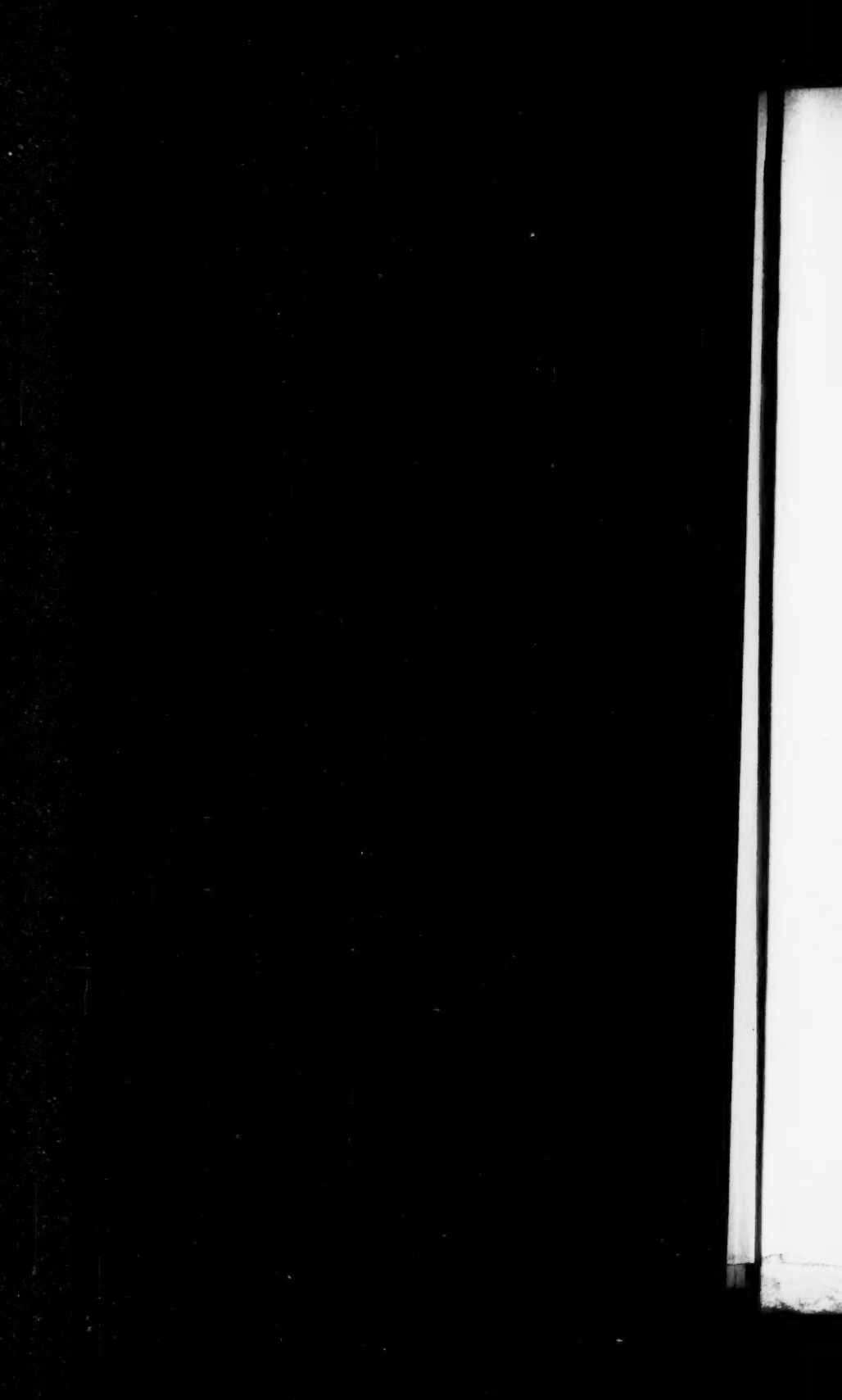
(SOUTHERN SECTION)

SHEWING THE BLOCKHOUSE LINES UP TO FEB. 1ST 1902.

SCALE 1/2,267,200 OR 1 INCH = 20 MILES

20 15 10 5 0 20 40 60 80 100 Eng. Miles

Zincographed at the Intell. Div.e War Office, 1902



the lines impassable. Without the co-operation of mobile columns blockhouse lines, however efficient, would be as futile to bring the war to a close as were the trenches and forts of the Spanish in Cuba. But with columns as mobile and effective as those of the Boers, and with a blockhouse system forming an insuperable barrier to the hunted enemy, the situation in South Africa would soon be brought to a satisfactory termination. The process, however, as in all guerilla warfare, is a slow one, the inevitable result of which has to be awaited with great patience.

NAVAL INTELLIGENCE AND PROTECTION OF COMMERCE IN WAR.

Lecture delivered by Captain (now Sir JOHN) COLOMB, F.R.G.S., F.S.S., on 13th May, 1881.

[This Lecture, which, in the opinion of experts, is the ablest exposition that has appeared in this country of the absolute necessity for an efficient Naval Intelligence Department, is reprinted by special request.]

HAVING been asked by this Institution to deliver a lecture on the above subject, I think it my duty to do so. Though sensible of the honour conferred by repeated invitations, several considerations deterred me from at once accepting them; even now I am doubtful as to the wisdom of compliance. It is a grave question whether so wide a problem can be adequately treated in one short hour, and whether a matter of the most serious national concern can be publicly discussed without more danger of directing foreign attention to our deficiencies and difficulties than hope of remedy and removal by ourselves. Public opinion will not apparently turn out of the current of ever-changing, but now always purely military, theories of insular defence requirements, to a calm, quiet contemplation of the grim realities of modern maritime war to a people dependent on the sea for daily bread. The rapid and increasing diversion of English thought out of the great, broad channels of actual and real national requirements, into little whirlpools and back eddies of abstract military experiments, is to be deplored; it is not, however, to be wondered at. Every Volunteer from the Land's End to the Orkneys, every Militiaman from Dover to Donegal, is the apostle of a purely insular theory of defence, the practical preacher of *purely* military precautions; Russell, from nearly all battle-fields of modern times; Hozier, from the "Mountains of Rasselas"; Brackenbury, from the plains of Italy; and Forbes, from the ruins of Sedan, have so stirred the heart of England that her head has well-nigh ceased to regard the influence of water as practically ruling the whole principle of her own and that of her Empire's defence. No eloquent descriptions of tactical struggles for strategical positions have yet been dated from "equatorial crossings," or from "off Cape Horn"; no great populations at centres of manufacturing industries in the very heart of England have been thrown out of work by far-distant war operations against us interfering with the supply lines of raw material; hunger pangs have not been felt by multitudes through the capture of grain

vessels, or by that rise in insurance to cover war risks which will certainly be in direct ratio to the organisation, adaptation, and sufficiency of the pre-arranged defence of our sea-lines all over the globe.

Every School Board boy in the United Kingdom has some notions, however vague, relative to soldiers and invasion, but millions of intelligent grown-up Englishmen to-day have no distinct views at all as to the defence of the sea. They dream that that matter was settled once and for all by the victory of Trafalgar, if not by the defeat of the Spanish Armada. Yet, only by methodical, complete, and Imperial pre-arrangements, can England, in days of steam and huge commerce, face maritime war without dread, or hope to emerge from it without disaster. An Empire having thousands of vessels counting millions of tons, annually carrying to and from every corner of the world its goods, in value approaching a thousand millions sterling, cannot hope to localise her naval wars; nor can it be for one moment assumed that a maritime position so constituted and of such extent, can be defended simply by individual skill or even genius of naval commanders. War fleets must be separated by long sea intervals; however efficient they may be, they are but as flies on great commercial wheels revolving round the world. They can provide but small security to sea-lines of thousands upon thousands of miles in length, unless they act in combination and are subordinated to a general carefully prepared and preconcerted plan. I shall presently produce some broad facts which it is to be hoped will sufficiently establish the absolute necessity for more public attention being directed to this matter. I shall submit some calculations as to the actual money value of the various divisions of oceans to England and her Empire; I shall do so merely to illustrate relatively what is past all price, viz., the practical, social, and indeed the life and death consequences involved to the English race in the precautions taken for securing in war the safety and freedom of the sea. It is not too much to say that the loss of a whole British Army on Continental battle-fields could not of itself produce the catastrophe sure to follow as a direct and immediate consequence on the interruption of even one of our main sea-lines of supply. One would cause mental anguish and a fall in the Funds, the other would add to these physical suffering by a rise in bread. The forcible curtailment of *imports* of grain and raw material, and of the *exports* of manufactured articles, means a cry from millions, for bread which could not be given, for work which could not be obtained. No one who hears me or who reads this paper is without influence. Be it little or great, all have some, and my reason for coming here to-day is to appeal for the exercise of that influence to turn attention more towards a true realisation of the primary requirements consequent upon our Empire's exceptional position, and to the pre-arrangements necessary for their adequate and complete

fulfilment. The few words I think it desirable to say may, I hope, be of some slight use to those whose influence cannot be without some result. That great multitude of Englishmen who sway the defensive policy of our Empire, know nothing at all of what England at war with even one great Power means in days of steam and gigantic commerce; and while some are enthusiastic about every detail of the last military experiment, nearly all seem placidly content to trust to luck and some powerful ironclads, to make everything quite safe and easy for us on the sea.

It seems to me desirable to make these prefatory, if somewhat personal, remarks, because every year's consideration of this and similar subjects, on which I have so often spoken in this theatre, increase my sense of its awful importance, and, therefore, of the grave responsibility incurred in the method in which it is submitted for discussion and publication. Sixteen years ago I fancied it possible some good might come of venturing to write and speak on these questions, differing as I then did, and do now, with the popular view of the aspects of British defence. Now, finding myself only beginning to approach the verges of true knowledge of its depth, I fear it is more likely such slender contributions to the literature of so great a subject may do more harm than good.

Having thus explained my sense of responsibility, and my reason for overcoming a disinclination to incur it, I proceed to submit some general observations on the necessity for establishing an organised and far-reaching system of naval intelligence.

The Scope of Naval Intelligence.

Naval intelligence comprehends within its scope a vast number of subjects widely different in their nature, but in their several orbits controlled by one great general consideration, viz., the efficiency and adaptation of our naval means to the work to be done in war. Now the two main conditions to be fulfilled by the Naval Service are the closing up of our enemy's ports and the protection of our own commerce on the high seas from depredations. Attacks on the high seas will be made by hostile cruisers which may elude the vigilance of blockading fleets, or by vessels purchased, fitted out, and armed in rear of our fleets, perhaps thousands of miles away from the blockaded coasts. It is to be observed that while the extent of the enemy's seaboard limits the operations of blockade, the area of operations for the direct protection of our commerce has, in a geographical sense, practically no limits at all. While I am speaking, British smoke from British coal burning in British steamers, carrying *foreign* food to British mouths, material to British manufactories, and goods to British warehouses, is blackening the airs of the tropic, the temperate, and even of the arctic zones. At

this moment British sails are being blown away in dreary morning watch kept by British seamen at the antipodes, are idly flapping in the regions of calms in both hemispheres, and being frozen stiff in arctic, and even in antarctic, seas.

As naval operations may be grouped under two great heads, so naval intelligence may be classified in two divisions—one referring to blockade, the other to the direct protection of commerce. The broadest difference between the sort of "intelligence," essentially necessary to success in undertaking either operation, appears to me to be this—that in one case what is most required is knowledge of your enemy's position; in the other, knowledge of your own. In both cases success will relatively depend on knowledge, down to the smallest detail, of the work to be done. The operations of blockade are carried on against a seaboard fixed and invariable, and against naval and military appliances wielded under one direction, for a distinct and settled war purpose. The conditions which determine operations for the direct defence of sea-commerce are almost the reverse. The carrying trade to be protected is not fixed, it varies with circumstances, both in direction and value, and is the visible resultant of many thousand busy minds, working ceaselessly in all parts of the globe by many thousand processes for individual peaceful objects. These objects defy the control of war policies and War Ministers, for they are only attainable by obedience to the eternal laws of supply and demand. These laws have survived the Tyrian, Carthaginian, Venetian, Spanish, and Dutch sea supremacies, and will survive so long as business in the world is done. Those who think that the movements of British commerce could be made to conform to arrangements for its protection by convoy war-ships should really picture the scenes "on 'Change" in London, Manchester, Liverpool, and hundreds of business centres in England, to say nothing of Sydney, Montreal, Melbourne, Calcutta, Cape Town, etc., which would follow the posting up of an Admiralty notification that "the Imperial sea-roads were so interrupted that arrangements were under immediate consideration to provide, so far as means would permit, convoy protection for £800,000,000 worth of exports and imports, and the entry, clearance, and safe passage of several million tons of British shipping from and to ports on every sea and ocean in the world." The figures I offer as a stippling-in of the background of the picture, because they are founded on the official returns for last year. The time would then, I think, have come for the operations of invasion to be wholly unnecessary for our complete subjugation. Our Volunteer Army would not then need a commissariat department, because nearly one-half our home Army, as well as civil population, would have no food. The burning question which exercises some minds now as to whether our Militia shall wear gold or silver lace would then lose much of its point.

It is very desirable to keep clearly in view the broad issues of great national defence questions, and I specially allude to the one of convoys, not as a matter to be settled in a "ten minutes" discussion, but for patient calculation and serious study. Were naval officers afforded by the nation, as they should be, opportunities of studying, as part of their superior professional training, the directions and variations of that huge commerce, the safety of which in war will be committed to their keeping, I confess I think systems of naval intelligence and principles of sea strategy would replace, more or less, vague national ideas as to convoys. But, be it observed, England affords her naval officers no such opportunity.

Varieties of Subjects with which Naval Intelligence has to deal.

A vast number of subjects are embraced under the term "naval intelligence," some common to both divisions before mentioned, others specially or more closely connected with one rather than the other. I can, however, in the time only glance at some of the principal ones. Those common to both relate to hydrography, meteorology, the naval policies and arrangements of foreign nations as indicated by the war-vessels they build or buy, the material resources, active or dormant, of maritime nations, both as regards construction, refitment, and maintenance. The principles and details of construction, armament, machinery, appliances, and efficiencies, or deficiencies of their war-ships; all matters relating to the *personnel*, both active and reserve, of their war navies. These headings sufficiently indicate what may be considered common to both branches of naval intelligence.

Special to blockade are—topography of coast and river districts, embracing detailed information respecting railway and canal communications of war and mercantile ports. Railways may afford facilities for moving fleets of efficient torpedo-boats from one port to another more rapidly than water permits a blockading force to do, and it is reasonable to suppose an effort to raise the blockade of a port would be developed through a cloud of torpedo-boats. The relative power of concentration possessed by the blockaders and the blockaded must exercise considerable influence on the strategical distribution of the blockading force. Railway and canal communications may also to some extent affect the question of fuel supplies of the blockaded. As my intention is to refer almost exclusively to the direct protection of commerce on the high seas, I am compelled to refrain from closer consideration of intelligence having reference to blockade. There are, however, one or two general reflections worthy of special remark.

[1] See valuable paper on "Tactics of Blockade," by Captain S. Long, R.N., in the JOURNAL, Vol. XXV., No. CX., page 316 *et seq.*

As regards hydrographical information, the experience of maritime nations testifies to the care and completeness exercised by our Admiralty in its collection, so far as oceans or seas are concerned. But it is doubtful whether we know as much as we ought to know about great rivers, such, for example, as the Amur, with its 583,000 square miles of hydrographic basin. No doubt the Military Intelligence Department in Pall Mall collects a certain amount of information respecting these, but military men know nothing of the naval aspects of the great rivers and their naval resources.

The short story I told in a former paper[1] here of the building and work done by the little Russian steamer "Aigun" in 1854, on the Amur, is a sufficient warning to us not to neglect the existence or development of naval resources many hundred miles from the coast lines. Obviously a naval, not a military, department should collect such intelligence, and divided responsibility should be avoided.

Respecting the policy, resources, the principles and details of construction, armament, appliances, and *personnel*, and that great host of matters and things which goes to make up visible naval war power, I, for one, feel confident that our Admiralty struggles hard to obtain complete foreign information with the *miserably scanty means* provided by the country for collecting it. It is a noteworthy fact that, while we have a great military "Intelligence" Department, and besides have a Military Attaché at the Courts of the Great Powers, we are quite content that one solitary naval officer should be charged with watching the naval developments and preparations of the whole of Europe! Yet invasions cannot be attempted, nor can we move even a drummer-boy beyond our shores without a naval operation, great or small, being the primary step of military movements so far as we are concerned. Under the heads mentioned there is a great variety of information respecting foreign Navies, which could, with great propriety, and *should*, I venture to think, be given by our Admiralty to naval officers who have now no means whatever of obtaining authoritative information, and who, therefore, will be in war entirely ignorant of much they ought to know.

As regards seaboard topography, railway and canal communications, of ports, etc., such intelligence is, I believe, collected by the military department; but practical experience of war generally proves that sources of failure are most often found between the chinks of divided responsibility. The very startling announcement made a few weeks ago in the House of Commons, "there could be no doubt the naval guns of England's fleet are inferior to the new guns on board the German, French,

[1] See "Russian Development and our Naval and Military Position in the North Pacific," JOURNAL, Vol. XXIII., No. CI.

and Russian ships,"[1] has been received by the country with comfortable complacency. It would be plunged in a state of excited indignation had it been asserted instead that the rifles of the Army were, without doubt, inferior to those of the same foreign Powers; but, as regards naval guns, it neither recognises the seriousness of the fact, nor reflects that it is the natural result of divided responsibility. When we are at war there will be probably twenty heavy guns brought into action on the sea for every one on land, yet the manufacture and preponderating opinion controlling the construction and fittings of naval ordnance is vested in those who cannot fight them on the sea, and under the direction of a military department, knowing nothing practically of sea warfare. The Admiralty, which is directly responsible to the nation for the efficiency of everything appertaining to the Fleet, has not direct control of its own ordnance. Nor is there any reason why the Admiralty should not itself collect intelligence in this matter of military seaboard topography, having, as it has, qualified officers available for this service. Why should Marine Artillery officers be employed as professors at the Staff and Military Colleges instructing military students in military art, while the Admiralty has to rely on the War Office for such topographical information as is necessary for naval operations on an enemy's seaboard?

I mention these things, not because, as all my former writings will amply testify, I either underrate or undervalue the great and grave importance of the military arms of England, not because I do not feel as thoroughly as anyone the necessity for purely military Intelligence Departments,[2] but because it is my endeavour to look beyond popular fancies and natural professional leanings, and to state plainly matters of fact as they appear to me. In dismissing from further examination naval intelligence in its general aspects or in the special aspects of blockade, I would submit that it would appear that while advancing science and modern appliances in no way diminish the absolute necessity of blockading an enemy's seaboard as the first step towards protecting commerce, they do diminish the probability of making a blockade effectual and complete; and in proportion as such probability is reduced, so must increased precautions be taken for the direct defence of commerce on the high seas. It is now to this main portion of my subject all further remark will exclusively apply.

Naval Intelligence in Relation to the Protection of Commerce.

Under this head the intelligence required is:—

1. The general laws which, under normal conditions, govern the

[1] *Vide* speech of the Right Honourable W. H. Smith, M.P., in debate on Navy Estimates, 1881.

[2] Besides the department under the War Office at home, there is also one in India.

distribution of British sea commerce over the world, both as regards time, place, and value.

2. The particular influences which any particular wars are likely to produce on the direction and value of British commerce passing over different sea-lines. The blockading of a coast, for example, would prevent the laws of supply and demand being satisfied by means of sea communications terminating on that seaboard; the imports which would otherwise have been absorbed by the ports blockaded will, to a greater or less degree, according to circumstances, seek other markets and be diverted into new channels,[1] thus causing a variation in direction and value of sea-commerce.

3. The careful and continuous observation of the development and resources of grain-producing lands, the periods of the harvests, and the visible supplies available for export.

I have so often dwelt on the all-important question of the critical position of the food supply of the United Kingdom in war, that I cannot stop now to add very much to what I have previously stated, except in a general way. We have Mr. John Bright's authority that between 1879 and 1880 "out of every four loaves of bread eaten by the people of the United Kingdom three loaves came from abroad";[2] in other words, over the sea.[3] Had we been at war during that period, therefore, whether the three loaves ever reached the mouths of our population would have been a matter entirely dependent on our naval means of protection, and on the accuracy of our naval intelligence. I would here point out that the geographical position of the source of our main supply has, within the last few years, shifted several thousands of miles from east to west, from the districts of the Euxine to the Western States of America.[4] The direction, length, and value of food lines has recently entirely changed,

[1] The war in the United States furnished an example: as the "Southern States did not draw down the usual supply of grain from the Northern," grain had to seek another market, the result being that it found its way to the United Kingdom, and to use the phrase of a commercial journal of 1863, "put out of gear the cycle of high to low prices." The same journal goes on to say, "Whatever injury America has inflicted upon this country by the blockade, we must count the enormous supplies of grain which she poured into our ports last year as some compensation." One effect of the war was to cause the Northern States to send us a great increase of bread, and to draw from us a great increase of lead.

[2] See his letter dated 18th March, 1881.

[3] I give Mr. John Bright's statement, because his words carry such weight. In this case, however, he has overstated facts as to the proportion of foreign and home bread consumed.

[4] It is remarkable that the Turkish troops at Volo were the other day supplied with bread stuffs from the States.

and that change will influence our naval arrangements in war. I have often seen discussions of a purely naval or military character based on the assumption of a war with the States. I would, however, beg you to look beyond the professional limits of such a supposition to the great national question of its present practical impossibility. We are at present dependent on the States for an enormous proportion of our food, and the British Empire, possessing grain-producing lands, now lying idle, yet capable, if populated and developed, of feeding hundreds of millions of human beings, could hardly resist the will of the States, because misery and starvation of the masses would reign in England, as a direct consequence of attempting to do so. But there is yet another great change impending in the sources of food supply. Thanks to the energy of Canada, with a population rather less than that of London, the construction of a British Pacific Railway has begun in earnest. Before long our food supplies may be grown under our own flag.[1]

4. Next comes the collection of information and continuous observation of the direction of coal exports from England and her Colonies, also from such countries as export coal for steam sea traffic, the average supply and demand, and the ratio of increase at all British and foreign coaling places. As a Royal Commission has been sitting for nearly two years charged with the special consideration of the state and defences of our coaling stations, I will not make further reference to them, and for the first time out of the many I have spoken from this place, it is satisfactory that such public action in the matter enables me to do so.

5. Next, the details of construction and speed of every merchant steamer in the world possessing power and capacity for adaptation as a war cruiser of attack, should be carefully and continuously collected.[2]

[1] The imports of grain coming as part cargo in steamers from Australia is steadily increasing, but such supply is but a drop in the great ocean of our food demand.

[2] To some this may appear beyond the scope of what is practically possible. It should, however, be remembered the enormous interests at stake; and, further, that there are not so very many steamers under foreign flags suitable for conversion into efficient war cruisers. We own about two-thirds of the steam tonnage of the world, the total (gross) of which is in round numbers 6,700,000 tons.

The following is a sufficient illustration of its distribution :—

	Tons.
Under British flag	4,200,000
,, American flag...	630,000
,, French ,, ...	420,000
,, German ,, ...	290,000
,, Spanish ,, ...	200,000
,, Russian ,, ...	130,000
All other	830,000
Total	6,700,000

These figures include all shapes and sizes of merchant steamers. I may also add that the best foreign steamers are as a rule built in Great Britain.

The nature of ordinary peace employment, and the ownership should be known, no matter under what flag she sails. The transfer of such vessels from one flag to another, is the operation of minutes only, involving private arrangements, payment of money, and the signing of names. The Peruvian vessels, for example, were so transferred the other day by private enterprise, to the flags of Germany and Russia. The whereabouts and movements from port to port, of all foreign steamers capable of conversion into efficient weapons of attack, should be at all times known at our Admiralty, and so far as is practicably possible, by admirals commanding abroad. It is only by the most plodding methodical daily collection and digestion of such intelligence during peace, that we shall on the outbreak of war avoid surprises by the issuing from unexpected and unobserved quarters of cruisers bought at one place, armed and equipped at another, and destroying our commerce somewhere else. Were our system of naval intelligence as complete and as far-reaching as the necessities of our huge commercial interest require, we *should* be able to prevent most of such vessels getting to sea on errands hostile to us: either by our immediate purchase of all such as are suitable for conversion, from owners who can be tempted to sell, or, if outwitted in this by our enemy's agents, then by shutting the vessels up in port.

No nation with its direct sea route stopped by blockade will long continue to purchase merchant steamers for conversion into armed cruisers, if the result be that most of them rot in the neutral ports, owing to the efficiency of a British Naval Intelligence Department unceasingly but quietly at work, and the careful attention of British ships of war which, from the very commencement of hostilities, if not before, dog suspicious characters from port to port. They must have speed, staying power, and strength enough to do so. We are now trusting to our material resources, and the mere possession of great national wealth, to save our commerce somehow or other in the hour of its peril; but if we do not use our national brains, even to the extent of recognising the necessity for establishing a great and far-reaching system of naval intelligence, that peril when it comes will, I venture to think, speedily terminate in the ruin of our carrying trade. It is the very first stage, rather than the closing scenes of maritime war, which decides the fate of such trade. American war fleets floated triumphant on the sea long after the American carrying trade—terrified by ocean fires kindled by an uncaught "Alabama"—had taken to itself wings and fled.[1] Moral effect is the great force to be reckoned with in considering the protection of

[1] A practical illustration may be useful. Taking the June quarter of 1860, two-thirds of the commerce of New York was carried in American bottoms; in the same period of 1863, three-fourths was carried in foreign bottoms.

commerce. If the first few weeks of war shakes that ignorance which blindly hopes that our naval arrangements for war are commensurate with our commercial necessities, the British mercantile marine will probably disappear in a reaction of panic.[1] What will happen during these first few weeks depends primarily upon the accuracy and extent of our naval intelligence. Peace affords the only opportunity of organising and systematising such intelligence, and maturing our plans. That opportunity will be gone when many submarine cables are dumb, when excitement reigns on British Stock Exchanges, in two hemispheres, and merchants and shippers crowd Whitehall clamorous for naval intelligence. Are they then to be referred to the Military Intelligence Department in Pall Mall, to obtain full details as to the roads to Berlin?

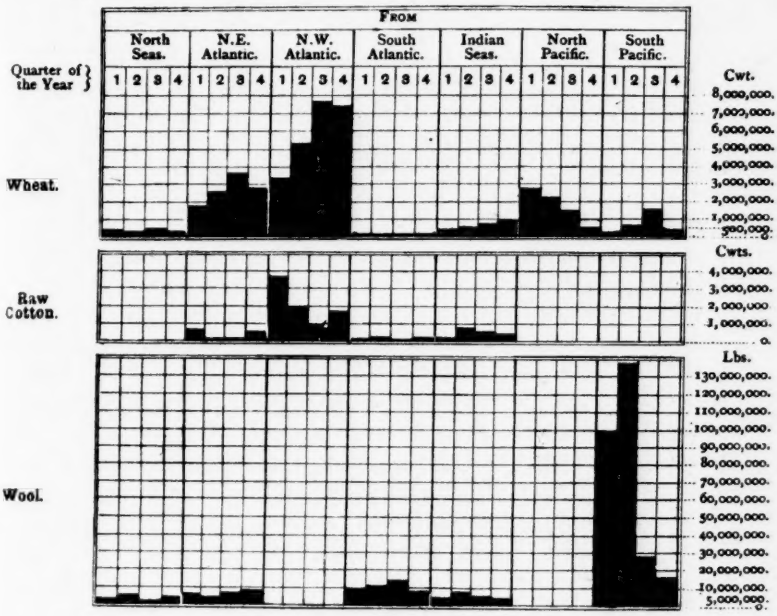
6. It is also of importance that all particulars concerning the exact position, nature of bottom, and depth of water in which submarine cables are laid, should be collected and furnished to naval commanders, so that they may know where to cut or tap them, or prevent others from doing so.

7. The necessity for collecting and rapidly disseminating information at all times as to the movements of foreign ships of war is so obvious as to require no explanation. It is to be hoped our method has been improved during the last twenty-seven years. Facts which I have come across in the course of my investigations, have astonished me in the overwhelming testimony they bear to national carelessness in this matter during the Crimean War. For example, as I have elsewhere stated, the officials at a most important naval outpost were left to learn that England was at war, from chance newspapers, and to the end of the war no official instructions were sent to them. In another quarter of the world, though we had steamers on the station, a Russian frigate rode at anchor in the middle of an English squadron, months after the Guards had been cheered through the streets of London, on their way to the East. Seven weeks after her parting company with the English squadron, she passed on the high seas under the stern of an English man-of-war. I happen to know the latitude and longitude where the curious scene occurred of an English vessel of war dipping her ensign to the frigate of a Power we had been fighting for months. Had there been any real attempt at the organisation, collection, and communication of naval intelligence before and during our last war with Russia, disaster and defeat of British naval forces in the North Pacific would not now stand

[1] In 1860, 13,638 tons of shipping were transferred from the American to the English flag. Month after month the number of tons transferred increased. In 1863, 252,579 tons were so transferred. Between 1860 and 1864 the American tonnage was reduced by some 2,000,000 tons.

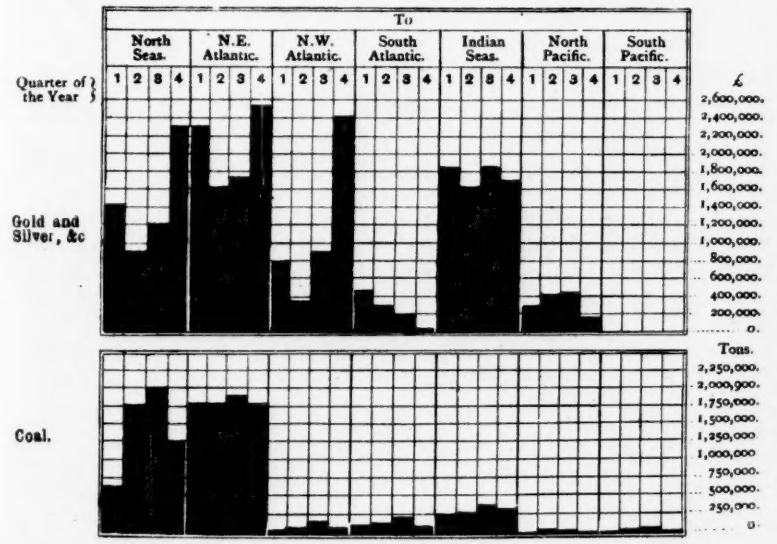
IMPORTS.

Diagram illustrating Average Variation in Volume, according to period of year.



EXPORTS.

Diagram illustrating Average Variation in Volume, according to period of year.



recorded in that same *Times* containing the telegraphic news of the Balaklava Gale, and the official despatch announcing our military survival at Inkermann. We did not then choose to have systematic naval intelligence as to the movements of enemy's ships, and the nature of fixed naval positions, and naturally we paid dearly for our neglect with the lives of Englishmen. "The wild roses and purple-hooded bells nodding,"[1] over long rows of English graves in the "green grass valleys" of Kamtschatka, mutely appeal for better naval intelligence. In 1855, we were unsuccessful off the coast of Asiatic Russia. The whole Russian squadron and garrison evacuated the position we had made great preparations to attack. It avoided one of our fleets, and was found by another, but escaped. All this was due to the absence of organised naval intelligence. Ten years later, and in the regions where all these scenes occurred, and where Russia is now wisely accumulating war cruisers, the wrecks of thirty Federal ships[2] strewed the shores of Behring's Straits, testifying to the naval intelligence possessed by the commander of the "Shenandoah," and to its total absence in Federal naval arrangements. To examine closely one of the foregoing sub-heads of naval intelligence necessary for naval efficiency would require a whole series of lectures, and, therefore, I can now only—by way of illustration—pick out one or two more prominent features of some for special notice.

As regards value, Table I. (*see* Appendix) shows the value of imports and exports of the United Kingdom from and to ocean districts in one year (1879), it further distinguishes between the values passing from and to the foreign and British seaboards in those districts into which I divide the world, their geographical limits being as follows :—

Northern Seas District.—On the west by a line drawn from Dunkerque towards the Pole through Dover, the eastern boundary being the seaboards in the German Ocean and the Baltic Sea.

North-East Atlantic District is bounded on the west by 30° meridian W., on the south by the Equator, and on the east by the continuous seaboard from where the Equator strikes the West Coast of Africa to Dunkerque, where it meets the limits of the Northern Seas.

North-West Atlantic District includes all the North Atlantic Ocean west of the 30° meridian.

South Atlantic District includes the seaboard of British South Africa with the Atlantic Ocean lying south of the Equator.

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[1] See "Tent Life in Siberia."—*Kennan.*

[2] Whymper saw them, *ride* his "Alaska."

Indian Seas District takes in the water area enclosed by the continuous coast line from the north-east of British South Africa to Singapore, thence by a line, including Java, towards the South Pole and back to Delagoa Bay.

North Pacific District.—All the Pacific north of the Equator between the Indian Seas District and the American Continent.

South Pacific District.—All the Pacific south of the Equator between these limits.

The chief lesson to be learnt from Table I. is the great disproportion between the value of exports and the value of imports from and to the foreign seaboards in districts where there are both foreign and British seaboards, while they nearly balance in the case of the seaboards which in these districts are British.

Where, therefore, the import or "homeward" route and the export or "outward" routes are not from physical causes geographically identical, there is a difference in the financial value to us between the lines to and the lines from foreign seaboards, while in the case of those to or from British seaboards there is practically none. It is this sort of fact and many others which underlie it, which naval intelligence should constantly be investigating and taking cognisance of.

Table II. gives the number of steam and sailing British ships which, in one year (1879), entered and cleared the United Kingdom from and to seaboards in the several ocean districts with cargoes, while Table III. gives in the same manner British ships in ballast. These figures, including as they necessarily do repeated voyages, are not the actual number of individual ships, but relatively they are strictly accurate. It is necessary to remind you I am, in order to avoid confusion, at present confining my observations and figures to the trade and shipping of the United Kingdom only; presently I shall refer to the trade of the Empire.

Now, there are several lessons conveyed by these Tables II. and III. I can, however, only refer to one or two selected for the purpose of giving continuity to these general illustrations, leaving those who choose to study them to find out the others. As regards vessels carrying cargoes, it appears from Table II. that the arrival and departure of sailing-ships from and to foreign ports nearly balances, while the clearance of steamers with cargoes was about one-fourth greater than the arrivals; on the other hand, in the case of British ports abroad, while the sailing ships also about balance, the steamers carrying cargo from the United Kingdom to those ports were more than double the number of those arriving.

Reference to Table III. shows that out of 7,000 representing the steamers which came to or left our shores empty, only 73 entered and cleared empty from ports of our Empire. Further, out of over 4,000 empty ships which entered and cleared, but 456 came from or went to British possessions. Where, therefore, the sea lines to foreign ports do not geographically coincide with those to our possessions, the empty British ships will almost exclusively be found on the foreign sea lines. Here, again, we have a fact it should be the duty of naval intelligence to watch and digest, for sea commerce is not constant in its operation. The last columns of Table II. teach a still more important lesson, showing as they do the variation in the proportion of steam to sailing British tonnage employed in the trade of the several ocean districts. In the North Seas District, the proportion is about 12 steam tons to 1 sailing; in the North-East Atlantic District, 8 to 1; in the North-West Atlantic District, 5 to 2; and in the South Atlantic, 7 to 5 only; the conditions as regards Indian Seas are reversed, there being more sailing than steam tonnage employed; in the North Pacific, there are 3 tons sailing to 1 steam; and in the South Pacific, 5 tons sail to 1 steam. These facts are important in many ways. It is impossible, however, to dwell now upon more than one or two considerations they suggest. The limits of danger to merchant-ships in war as regards operations on the high seas lie between the port of departure and arrival, and as steamers traverse this area of danger at a greater speed than sailers, they are exposed to danger, in proportion to their speed, for a less time. If over a threatened sea-line a steamer can pass in six weeks while the sailer on the same line takes three months, the risk to the sailer is double that of the steamer. Again, the steamer can, in proportion to her power, vary her route, while the sailing-ship is forced, by atmospheric and other influences, into certain beaten tracks. The steamer can avoid a menaced area, the sailer cannot. I am only dealing with strategical matters, and, therefore, do not allude to the obvious tactical helplessness of a sailing merchant-ship when in sight of an enemy's steam cruiser, while the position of a merchant steamer in the same situation may not be one of danger if her speed be greater than that of her vulture opponent. Under these circumstances, to push enquiry no further, it may be said that the danger to which our sea commerce is exposed in any ocean district is proportionable to the preponderance of steam or sail tonnage. Taking the Table (I.) of value with Table (II.) of shipping together, it may, by way of general illustration, be assumed that, other things equal, though the total value to the United Kingdom of the North Seas District is three times that of the South Pacific, the danger to which the United Kingdom commerce in the South Pacific would be exposed in war is five-fold as compared with the North Seas. We have here, again, matters requiring vigilant and constant observation at the

hands of naval intelligence, for the proportion of steam to sailing tonnage is never the same, it is steadily increasing,[1] but not uniformly in all trade directions. Every ton of steam substituted for sail tonnage is a gain to the strength of our naval position in war, provided our naval intelligence and arrangements are sufficient to prevent its being frightened under a foreign flag by failure to protect our commerce at the commencement of hostilities.

The first line of Table IV. gives, in round numbers, the total values of ocean districts to the United Kingdom already given in full in Table I. The second line gives the values of ocean districts to India and the Colonies, *exclusive* of their trade with the mother country. Had these two islands been sunk beneath the sea, or otherwise disappeared from the map of the world during the year 1879, the figures on the second line of Table IV. would have still represented the values of surviving British exports and imports during that year, the aggregates being nearly £200,000,000. The third line adds together the figures on the first two, thus giving the Imperial values of the several ocean districts. Thus it will be seen that the total value of British commerce to be protected in war is about £800,000,000: more than one-fourth the sea trade of the whole world, British Empire included. It has been estimated that some 70 per cent. of the sea trade of the world is carried in British ships, and the value of British shipping is some £100,000,000. I should here remind you of the consequent enormous number of British ships employed carrying goods from foreign ports to foreign ports of which we have no account, but which will equally require protection in war. To conclude remarks on the simple values of ocean districts and shipping, it is desirable to observe that while the annual value of British sea trade is some £800,000,000, and though the value of British shipping on the oceans and seas is worth some £100,000,000[2] more, we are without any organised system of naval intelligence necessary for its safety in war, and the popular national idea seems to be that were the "Inflexible's" sides only made thick enough, her guns big enough, and the Admiralty worked cheap enough, she should almost single-handed provide safety for such gigantic trade.

But the simple values of ocean districts already given do not represent the real value of British commerce which passed over them in

[1] The number of steam and sailing-vessels (British) engaged in foreign trade in 1869, as compared with 1879, illustrates the above statement:—

1869— 810 steamers, 6,963 sailing.
1879—2,027 „ 4,832 „

2,183 decrease.

During the years 1877-80 the number of British steamers increased 22½ per cent., of French 25 per cent., German 17½ per cent.

[2] The value of British goods, etc., on the sea in each year exceeds our total National Debt!

one year. There is a process of accumulation due to the movements of commerce over the area of some ocean districts in passage to or from others. Table V. shows the oceanic accumulations resulting from the movements of British commerce in 1879, from hemisphere to hemisphere only. There are other and minor accumulating processes which must here be passed by. I compute the value to British commerce of the great passes from hemisphere to hemisphere as follows :—

	£
Viâ Suez Canal - - - - -	82,600,000
,, Cape of Good Hope - - -	50,000,000
,, ,, Horn - - - - -	33,400,000

It will be seen from this table that while the simple value, for example, of the South Atlantic district is but £28,700,000, the volume of trade passing *viâ* the Horn and Cape raises the value to £112,200,000 ; and, in like manner, there is an increase of simple values, as shown by the table, in the case of the South Pacific and the Indian Seas districts. As regards the North-East Atlantic it is obvious that, as the southern and western seaboards of the United Kingdom are situated in that district, and as the United Kingdom trade with all districts, except the North Seas, is £449,500,000, these figures represent the accumulated value of the North-East Atlantic to the mother country only; but as the rest of the Empire has a trade in this North-East Atlantic district of £26,900,000, and also a North Sea trade passing over it of £1,400,000, the Imperial accumulated value of this North-East Atlantic district is £477,000,000. The actual value of the waters of the United Kingdom is, of course represented by its total trade with all districts, viz., £600,000,000 odd. I cannot say more on the variations of values as regards place, but must pass on to illustrate variations as regards time. Accumulations are not simultaneous, and it would be the function of naval intelligence always to know not only where the major and minor accumulations are taking place, but also when and how. As the movement of the protecting force must be ruled by the movements of commerce, to be without such intelligence kept up to date is, to my mind, to court terrible national disasters on the outbreak of war. At Lloyd's it is daily known where British ships are[1] in certain districts, and

[1] Through the kindness of the Secretary of Lloyd's, I am informed of the following facts showing progress of our mercantile marine and Lloyd's system :—

Number of Reports of Sailing Arrivals, etc., Lloyd's Lists, 1860 and 1880.

Year.	Sailings.	Arrivals.	Speakings.
1860	33,899	158,921	11,507
1880	288,919	373,822	24,258

probably on the declaration of war that association would telegraph, telling merchant-ships where our war-vessels were when last heard of. But these war-vessels will change positions; perhaps they may be looking for enemy's cruisers whilst our merchant-ships are looking for them, as did Federal war-vessels which never caught the "Alabama" until she was driven into Cherbourg by need of repairs. The system of Lloyd's is perfectly adapted to Lloyd's business—insurance for the protection of individuals directly concerned against the risks of the sea; it could daily furnish much valuable *data* necessary to naval intelligence required for the protection in war of our greatest national interests.

The diagram headed "Imports" illustrates in a simple manner the increase and diminution of volume varying with the seasons of the year. It is not necessary to point out the original causes producing the results here exhibited. Everyone knows that the harvests of the world are not simultaneous, and that when in one hemisphere they are reaping, in the other they are sowing. But there is another influence which determines the period of the year at which the crop reaches us, the sea distance it has to cover *before* it reaches us. For example, the wheat which comes to us from the North Pacific States of America is grown within a comparatively short distance from that which finds its way *viâ* the North-West Atlantic, from the neighbouring districts of the United States; but from the date of "export" from those seaboards respectively until the date of its arrival here there is a difference of three and a half months. A grain vessel leaving Portland, Oregon, for the United Kingdom will, as regards time, be in war exposed to risk of capture for four and a half months, while the grain vessel simply crossing the North Atlantic will only be so exposed for one. North Pacific wheat will be accumulating in the South Pacific in the last quarter of the year, and more Australian wheat exposed to capture "off the Horn" when the trees are budding in Hyde Park than at any other time. The dates and extent of maximum accumulations of our wheat, raw cotton, and wool at various points in the ocean can be broadly arrived at from this diagram. I shall merely draw attention, however, to three general facts. From a successful attack on our commerce in the North-West Atlantic in the autumn we should suffer most as regards food. If that attack was delivered two or three months later the hands in Manchester cotton mills would suffer the heaviest blow; if, however, in the spring of the year our commerce passing over the South Atlantic was interfered with, Yorkshire operatives would be the greatest victims. The export diagram shows how the flow of precious metals is to some ocean districts constant, and to others variable as the seasons change. An import diagram of gold and silver would show a different distribution, but about the same amount coming as going; the South Pacific column would not be a

blank, as on an average some £5,000,000 a year comes from Australia. The coal diagram shows the tremendous absorption of British coal by seaboards in the North Seas and North-East Atlantic districts, which are, with small exceptions, foreign, not British. It will be seen from this that on the outbreak of hostilities there would not be much difficulty in the supply of British coal to enemy's cruisers, it can be easily transshipped at neutral ports and sent in foreign bottoms where needed. On an average, 1,300 British and 1,100 foreign coal-laden ships leave our shores in each month for the several ocean districts according to their demands. Whether in war our enemy's cruisers get British coal to enable them to operate against British commerce will entirely depend on British naval intelligence. The commander of a cruiser knowing his business would be fully aware at what points out of sight of neutral seaboards he could calculate on capturing from one to perhaps fifteen British coal-ships per week; while a British naval commander, perhaps in search of him, and with coal bunkers half empty, might be on a main route, say 100 miles outside, and not know where to find coal on the sea, because he has never had an opportunity of learning, and no naval intelligence is organised to put in war complete instructions on this and other matters into his hands with his sailing orders. It may be asked, how is the hostile cruiser's captain to know where to go to? The answer is simple. The interest of trade necessitates the publication of complete information for its own purposes. The operation of enemy's cruisers and the instructions to their commanders will unquestionably be carefully calculated and prepared from information collected long before and up to date from voluminous papers and returns—some official and others non-official—daily published in England, that great centre of the world's trade and great national defaulter in this matter of organised naval intelligence for war.

I would here take the opportunity of expressing my obligations to Mr. Woods, the editor of *Dornbusch's Lists*; Mr. Turner, of the *Mark Lane Express*; Messrs. Gooch and Cousins, of the great wool warehouses; to the editor of *Brown's Export Lists*, and others too numerous to mention, who have enabled me to accumulate more facts than I could possibly make use of in a single paper here. I am also greatly indebted to the Peninsular and Oriental, the Royal Mail, the Anchor and the Pacific Navigation, and other companies, for much information kindly and readily afforded. In order to give some idea of the importance of our sailing trade, and for reasons which will presently appear, I have made out Table VI., which shows roughly the average number of grain and wool-laden sailing-ships on passage per week in each quarter of the year to the United Kingdom from three ocean districts. I have omitted the wool trade of the South Atlantic, because the larger

proportion of Cape wools comes as part cargoes in regular steam-ships; also the North-East Atlantic, because the grain and wool from the Euxine and Egyptian seaboards comes also in the steamers as a rule; last year, for example, the average number of grain-laden sailing-ships passing Constantinople for the United Kingdom was about eight per month, while the average number of steamers so passing with parcels of grain as part cargoes was twenty-two per month. With reference to the shifting of the sources of our food supply from the east of Europe to the Western States of America, I may incidentally state that over 1,400 British ships (to say nothing of foreign) carried grain to us from the single port of New York last year. This sailing-ship table is compiled from the best trade sources of information; but at best the figures can only be an approximation very far short of the actual numbers, and are only produced here for the sake of rough illustration.

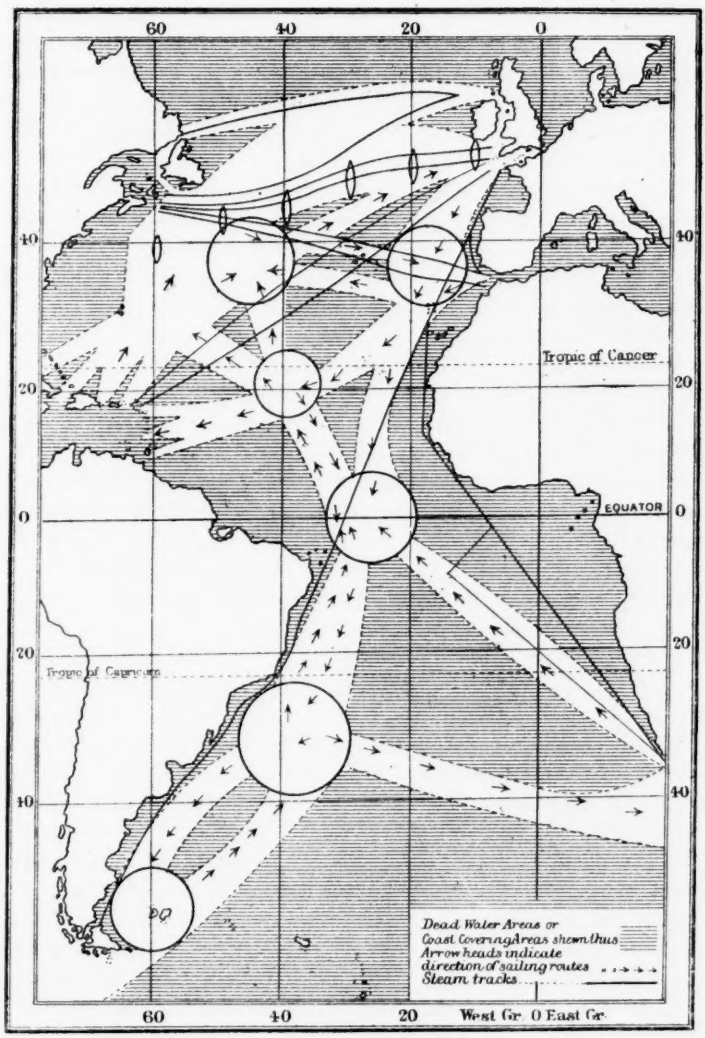
I would observe that the diagrams and the table of sailing-ships on passage represent the averages not for one year, but of a series; in the case of the diagrams the last six, in that of the table the last three years. Time compels me to abstain from further illustration, or from following up the complication of lessons those so rudely drawn teach. A great variety of very important matter I am obliged to leave wholly unnoticed. With the facts and figures herein offered I put in juxtaposition an extract from the speech of a most able naval administrator of our time. "When," said the Duke of Somerset in the House of Lords, "I was at the Admiralty, the little squabble about the 'Trent' question happened. One of the Lords asked me what would be done in case of war. I replied, 'I can tell you one thing I shall do—you will have to sleep on the Admiralty Board table, for I won't let you away.'"[1] In full view of even the outline of facts I have produced, and with this statement staring us in the face, I would ask, should not the unfortunate naval lord on the table—sleepless with work and crushed with an Atlas burden of responsibility—have at least the assistance of an organised and far-reaching system of naval intelligence? As regards information concerning the naval means and preparations of foreign Powers, I have no wish to raise a discussion as to whether a separate department of the Admiralty should be created for this special purpose, because the subjects for digestion are so various and so essentially different, that most probably it would be better for each branch, such, for example, as the construction or gunnery branch, to collect information relating to its own peculiar functions, rather than endeavour to lump every description of information in one single department. It is, in short, a purely departmental question, which those acquainted with the internal working of the Admiralty are alone

[1] *Vide Times*, 17th February, 1871.

competent to discuss. I do, however, venture to maintain that our huge sea commerce requires a special and distinct Intelligence Department so constituted as to be in a position to ensure that the Admiralty shall at all times have at its command the fullest and most complete information respecting the positions of our commerce on the sea, and the best possible intelligence relative to all those special matters to which I have referred. Further, I submit that such a department to be really efficient must absorb in itself the active, practical co-operation of the representatives of the great commercial interests to be protected on the sea in war. I may briefly outline my idea as to its constitution evolved by many years' consideration. I should wish to see established a Commercial Intelligence Council. The president to be an admiral with a seat at the Board of Admiralty, but whose sole time should be devoted to the collection, organisation, and digestion of intelligence necessary for the direct defence of sea commerce; he should have no other duties, for assuredly he would have more than enough to do. The members of the council of which this admiral would be president, should all be representatives of the greatest shipping and chief export and import interests, and the position and emoluments of these members should be such as to secure the services of those who have the fullest confidence, and the most intimate knowledge of the interests they represent, so that a seat on this council should be deemed to be of importance to the nation and a high honour to the individual. The admiral would then be in direct communication with the best sources of information, and his naval knowledge and experience would enable him to sift and lay information before the Board of Admiralty in a form available for practical application. There must, however, be subordinate departments in our great Colonies, presided over by naval officers of superior rank, and civilian members chosen on similiar principles, for there is nearly £200,000,000 of British commerce on the sea which finds neither source nor destination in the United Kingdom. These minor councils must work on the same lines as that at headquarters, and supply the admirals on the station with all information. It may be exclaimed that this would involve expense. My reply is, most certainly; but surely a Power having £100,000,000 worth of shipping and £800,000,000 worth of goods on the sea in each year, and which freely spends some £6,600 a year on "Military Intelligence," cannot grudge £15,000 or £20,000 a year for the purpose of collecting and organising intelligence necessary for the safety of such wealth. The trade and shipping interest in Parliament is doubtless able to ensure the passing of a vote for the purpose so deeply concerning itself.

But even assuming that these centres of naval intelligence are established, one great question still presents itself for consideration. How is it to be communicated in war to naval commanders stationed perhaps

in mid-ocean and merchant-ships on passage? It is hardly within the bounds of possibility that we can spare swift vessels to run about the world with no other object but communicating orders and intelligence to fleets,



SKETCH-MAP ATLANTIC OCEAN.

squadrons, and ships. I cannot close without some brief remarks upon this most important branch of my subject. In the first place, it appears to me that in the direct protection of commerce, two main conditions

have to be fulfilled: 1st, the protection of the main ocean routes; 2nd, the protection of the water areas lying between the main ocean routes and the trading seaboards. We have, therefore, in maritime war to provide for three great naval operations, each having special circumstances peculiar to itself: 1st, the blockade of the enemy's coast; 2nd, the securing of the ocean routes of the world; 3rd, coast covering operations off neutral seaboards to provide safety for our commerce on passage between such seaboards and the ocean routes. I must confine my remarks entirely to intelligence on the ocean routes. Reference to the sketch-map I have prepared of the Atlantic Ocean very roughly indicates the main routes. I take this water district of the world for example, because it is, as we have seen, the area of greatest accumulation, and, further, because it is in a strategical sense the simplest to deal with. The shaded portions indicate what may be termed the "dead water areas" where they appear in mid-sea, and "coast covering areas" where they have land for one or more boundaries. The unshaded channels represent roughly the sailing waters, the arrow-heads indicate the direction of the route, and the circles indicate the junctions of one or more of these routes, the black lines crossing the shaded parts of the Atlantic Ocean are certain steam lines. To shorten and simplify my illustrations so as to save time, I shall only allude now to the southern portion of this sketch. I must, however, remind you that the areas enclosed by these circles must be held secure; that while their strategic value in a geographical sense does not change, the pressure of commerce, so to speak, varies in some cases with the seasons of the year; that there are in this one section of the ocean six circles, and each would require a considerable squadron to provide adequate safety, and that there is, over and above all, this one great main route across the North Atlantic with its own special peculiarities and naval needs. I might remark also that the diameters of these circles are not all equal; nor is the value of commerce passing over them the same; nor will the greatest periodic accumulations of commerce within these areas take place simultaneously; nor will the distribution of the squadrons protecting the areas be uniformly the same, as each has its own peculiarities of physical circumstances. I may call attention in passing to the fact that, as Table V. indicates, some hundred millions' worth of our commerce annually passes over that part of the Equator enclosed by the circle on the sketch; in extent it is some 600 miles, and therefore a 12-knot steamer would take over two days simply to go from one end to the other, a considerable squadron would therefore be required for the adequate protection of this most important position. But, as also shown on the sketch-map, the great steam track to the Cape crosses the Equator a long way to the east of this circle, and as a general rule on every ocean, in proportion to the power

and endurance of the steamers employed, so do their routes vary and diverge from the sailing trade, for the more independent are they of these influences which rule the direction of the sailing trade. Now also in proportion to endurance and power are steamers efficient as weapons of war, and unless in war all the great steam lines are compelled to conform as far as possible to the sailing routes, we shall waste force, leave our position weaker than it need be, and debar naval intelligence from being passed with rapidity and certainty along our lines. It is useless to hold the fixed positions and "strategic areas" of the sea, however securely, unless the intervals between them are efficiently patrolled; it is absolutely necessary to do both, so that a cruiser will be driven to seek the waifs and strays of our commerce in "dead water areas"; where her game will not be worth the candle, or rather the coal, or have to seek her quarry off coasts where she should be dealt with by the coast covering force. Unless the admiral in command of an ocean fleet is kept constantly informed of the probable dates of accumulations of commerce over the various positions in his district, he must more or less be working in the dark. For example, the weekly average of grain ships due to arrive here from the South Pacific last August was thirty. It is known in the City what number of vessels and what quantity of food stuffs are on passage and from whence and when these ships are due to arrive at our ports. These South Pacific grain-ships would have been due to arrive within the limits of the equatorial circle in July, and a naval commander there might have known even the names of the vessels and all particulars about them six weeks before they came within the limits of his command. More than this, if the great steam lines conform to the sailing routes in war, each steamer would not only bring intelligence from squadron to squadron on the line, but would collect by observation a great deal of information as to the commerce *en route*, and communicate it to the squadron in passing. No cruiser could appear at any point of the routes without its being thus very soon known even to admirals hundred of miles away and in mid-ocean. Now it appears to be assumed that the best of our merchant steamers are to be armed, not for the purpose or continuing to follow their ordinary avocations in defiance of "Alabamas," but for general service here, there, and everywhere, supplementing our regular squadrons or carrying military expeditions. I would, therefore, submit for discussion a few very brief observations on this matter. To avoid any misapprehension, I must first say my conviction as to arming merchant-ships is this—that the exigencies of maritime war will necessitate our arming not merely a careful selection of the best, but every ocean-going British steamer. We must prepare in peace to give them at home and abroad armaments and trained instructors, and then on the declaration of war bid them follow their avocations and let our enemies know we mean to

carry on our sea trade, "in spite of their teeth," under the banner, if you like, of "Defence, not Defiance." I see no reason why, for example, the Peninsular and Oriental Company, with its twenty steamers a fortnight on the oceans, could not answer for the patrol and intelligence duties on Indian and certain Australian routes without any very serious interference with the ordinary duties of their trade, provided the trained gunnery instructors, guns, fittings, and magazines be forthcoming at once, when wanted at points along the lines. Now, if on the other hand, the best of this Company's steamers are taken off the line in war and attached to the Royal Navy for general service, the gold and silver so constant in its flow as shown on the diagram must be carried in inferior vessels, less capable of fighting or even running away from an enemy's cruiser, you thereby increase the chance of capture, and every capture will frighten so many merchant-ships under a foreign flag. To an Empire unconsolidated for purposes of common defence, maritime war may prove a severe strain; it is largely through colonial subsidies the vessels employed in the Imperial Mail Service are so efficient, so capable of adaptation as weapons of war. Will their removal off the line in the hour of colonial peril produce that confidence essential to willing co-operation? As Sir Alexander Galt pointed out the other day, the Colonies take more of our manufactures than all Europe; by removing the best of the regular colonial steamers, you force a considerable proportion of some fifty millions' worth of exports to the Colonies and India into the holds of the lame ducks of steam companies' fleets, and thus deliberately increase the chances of capture.

I submit such views to the examination of those who think that for general service the Royal Navy can be largely supplemented with the best of our merchant steamers, and, therefore, conclude that the deficiency in strength of the Royal Navy can be made good in a hurry by drafts on the steam mercantile marine. I venture to think that the full gravity of the problem of protection of our commerce is not even faintly realised by the country, and that what its solution involves is not in the smallest degree understood. It is a matter with which national ignorance likes to fiddle, but which national intelligence apparently fears to face. It would be very desirable that some practical experiment in order to rouse national attention should be tried. We have had manœuvres to test our readiness for invasion; why not test our readiness to guard the people's food? Such an experiment would cost but little, and might thus be carried out. Take the "Hecla," or hire a merchant steamer, give her a roving commission, such armament as she can carry, and a plentiful supply of red or white paint. Let her put to sea and disappear. Give notice to the admirals abroad, and allow them ample time to make their arrangements to protect commerce from this pretended hostile

cruiser, which, instead of capturing and burning, might be authorised to paint on the side of any British vessel boarded at discretion either a large C for capture, or B for burnt. Of course, if brought within range of a war-ship of superior gun power, the experiment must terminate, as the cruiser's career may be presumed to have finished, but by all means let her go on marking British ships until that happens, even though C's and B's crowd our ports. This experiment would be of more value than a hundred papers such as this to determine the question whether systematic organised naval intelligence is or is not a great national necessity.

Postscript, 1902.

The republication of the above paper, twenty-one years after its delivery as a lecture, renders it desirable to offer some observations which may be of use to readers of it now.

On the 4th March, 1882, at the next annual meeting of the Institution after the delivery of the lecture, the First Lord of the Admiralty (Lord Northbrook) presided, and, in reviewing the work of the Institution during the previous year, referred to the paper and said he had "read it with very great interest." He added "the subject is one of very considerable importance, and those officers present who are interested in it will be glad to know that the Board of Admiralty have taken the matter into consideration, and that they hope they have set on foot a system under which the materials of Naval Intelligence, which already exist in the Department, somewhat scattered, will be brought together, and will be supplemented by information derived from the best officers who come home from time to time, from different stations in all parts of the world."[1]

As a result, there appeared in the Navy Estimates, 1884-5, for the first time, on the Admiralty Office Vote, a charge for £1,796 for Foreign Intelligence Committee. A Parliamentary Return I moved for in May, 1888,[2] showed that the establishment of the Foreign Intelligence Committee dated from 10th April, 1884, but did not become a Naval Intelligence Department until 1st February, 1887. This return also revealed the curious fact that in 1886-7 we were spending £14,164 on the Military Intelligence Department, besides £4,276 on Military Attachés, but only £4,648 on the Naval Intelligence Department and £996 on Naval Attachés.

This financial year (1902-3) the charges for naval and military Intelligence Departments and Attachés respectively are as follows:—

[1] Journal, Vol. XXV., p. 20.

[2] No. 173. Session 1888.

Naval.		Military.	
Intelligence Department ...	£10,926-	Intelligence Department ...	£16,679[1]
Naval Attachés	6,800	Military Attachés	8,270
	£17,726		£24,949

I may add that the head of the Military Intelligence Department now receives £600 a year more than the head of the Naval Intelligence Department.

As regards the diagram and tables, it is to be observed they were produced for the illustration of principles. Those principles remain, but the figures of course have changed. The expansion in value and volume of British sea-trade during the twenty-one years which have elapsed since they were prepared has been great. The following notes may be useful to students.

Suez Canal.—My estimate of the approximate value of British Trade annually passing through the Suez Canal at the time of the lecture was arrived at after elaborate research and laborious investigation. It was the first attempt to endeavour to determine the question, and caused some comment, resulting in a Board of Trade investigation into the matter, and a Return being presented to Parliament.[2]

That Return will repay perusal, showing as it does the extreme difficulty of anything approaching accurate computation, and these difficulties have rather increased than diminished. The Return only dealt with the trade of the United Kingdom passing through the Canal. My estimate included all British interchange so passing. With this allowance, the two estimates will be found to be fairly in accord.

The absence of reliable *data* upon which to base a computation of the annual value of British trade passing through the Canal, of course renders it impossible to make a really reliable estimate of the annual value of British trade passing round the Cape or even round the Horn.

The following table gives the figures of British ships passing through the Canal in 1879 (the date of the tables in the lecture) and in 1899:—

British.

Year.	Number of Ships.	Net Tonnage.	Gross Tonnage.
1879	1,144	1,752,389	2,508,524
1899	1,905	5,319,136	7,389,236

[1] "Hansard," Vol. 102, p. 984.

[2] Parliamentary Paper No. 41, February, 1893.

In 1879, France, with 102 ships with gross tonnage of 271,598, was next to us in order of usage of the Canal. Germany, with only 70 ships with gross tonnage of 174,485, was third on the list, Holland being second.

In 1899 Germany held second place to us with 387 ships, having a gross tonnage of 1,492,657, passing through the Canal.

This is not surprising in view of the rapid growth of the steam mercantile marine of Germany, as exhibited in the following table :—

Germany—Steam Shipping.

Year.	Number of Ships.	Tonnage.
1879	374	196,343
1899	1,293	1,150,159

The steam tonnage owned by the British Empire was, in 1879, 2,733,269 tons ; in 1899 it was 7,423,404 tons.

I commend to the attention of students the papers which were contributed to *Commercial Intelligence* (168, Fleet Street, E.C.), by Lieut. Carlyon Bellairs, R.N., on "The Suez Canal," and which appeared in that organ on 1st April and 20th May, 1899 ; and also a paper on "Our Over-Sea Trade" in the same journal, of 19th November, 1901. They are the most valuable and instructive contribution to knowledge on the subject of which I have any cognisance.

Wheat, Wheatmeal, Flour, etc.—Since the date of the lecture, imports have risen from 73,002,110 cwt. to 98,505,117 cwt.

Raw Cotton.—Imports have risen in the same period from 1,469,358,464 lbs. to 1,760,206,672 lbs.

Wool.—Imports from 417,110,099 lbs. in 1879, to 668,817,315 lbs. in 1899.

It is desirable here to call attention to a very remarkable paper read by Lord George Hamilton, M.P., before the Royal Statistical Society, on 20th February, 1894, entitled "Ocean Highways: their bearing on the food and wages of Great Britain." It is quite a mine of information on a question of transcendant importance, and throws the clearest light on our economic position in relation to sea commerce, for the safety of which the Navy has to provide.

Coal.—When my lecture was given, the latest return showed our Coal Export to be 7,206,799 tons, in 1899 it was 43,111,404 tons.

This sixfold increase of coal export is a startling and ominous fact. In this connection, students should study the important and striking paper read before the Society of Arts, 7th June, 1901, also by Lieut.

Carlyon Bellairs, R.N., on "The Coal Problem: its Relation to the Empire.

Imperial Trade (vide Table IV.)—It is sufficient to observe that since the date of my lecture the annual sea-trade of our Empire has nearly doubled, the increase being greatest in that branch of British trade which neither goes from, nor comes to, the United Kingdom.

In concluding this postscript, I desire to place on record my strong conviction that the Admiralty is undermanned, and the constitution of the Naval Intelligence Department wholly inadequate. I adhere to every word I said in my lecture twenty-one years ago as to the extreme gravity of our economic situation, and the few figures given in this postscript sufficiently show that its peril in war is deepening and widening.

I freely confess to grave doubts as to the sufficiency of our naval means, organisation and administration, to secure the British economic position in war.

From the effects of failure there can be no recovery.

JOHN C. R. COLOMB.

12th April, 1902.

APPENDIX.

TABLE I.—*Value of Imports and Exports to and from the United Kingdom only, from and to Seaboards of the World, grouped by Ocean Districts, and for one Year only (1879), also distinguishing Foreign from British Seaboard Commerce in these Districts.*

Designation of Districts.	From and to Foreign Countries in District.		From and to British Possessions in District.		Total value Imports and Exports grouped in Ocean Districts.
	Value of Imports.	Value of Exports.	Value of Imports.	Value of Exports.	
	£	£	£	£	£
Northern Seas District	78,420,941	72,082,722	Nil.[1]	Nil.[1]	150,503,663
N.E. Atlantic ,, ...	78,277,323	55,215,551	801,010	2,540,074	136,833,958
N.W. Atlantic ,, ...	93,521,458	31,544,755	17,718,615	9,140,023	151,924,851
South Atlantic ,, ...	6,041,899	9,229,204	4,682,409	6,417,921	26,371,424
Indian Seas ,, ...	2,010,116	2,449,796	21,681,286	26,429,791	52,600,989
North Pacific ,, ...	17,646,906	9,266,247	1,357,085	3,208,227	31,478,465
South Pacific ,, ...	8,100,603	2,486,116	21,964,440	17,959,705	50,510,864
Total...	284,049,237	182,274,391	68,204,845	65,695,741	600,224,214

[1] It is to be observed that Heligoland and the Channel Islands are excluded from these Tables, being considered as parts of the United Kingdom.

TABLE II.—*Number of British vessels Entered to and Cleared from United Kingdom (including repeated Voyages) with* CARGOES *from and to Seaboards of the World, grouped by Ocean Districts, and in one year only (1879), distinguishing Foreign from British Seaboard Commerce in those Districts, and also Steamers from Sailers; and showing Aggregate Total Tonnage of all.*

Ocean Districts.	From and to District Foreign Ports.				From and to District British Ports.				Total entered and cleared to all Ports.		Tonnage entered and cleared to all Ports.	
	Entered.		Cleared.		Entered.		Cleared.					
	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.
Northern Sea District ...	6,547	2,025	8,262	2,193	[1]...	[1]...	[1]...	[1]...	14,809	4,218	7,275,364	659,931
N.E. Atlantic ,, ...	8,342	2,903	10,476	4,266	35	29	538	59	19,391	7,257	8,529,765	1,147,509
N.W. Atlantic ,, ...	1,455	1,628	1,174	648	270	1,639	330	1,013	3,229	4,928	5,562,524	2,991,519
South Atlantic ,, ...	162	231	220	586	73	67	91	286	546	1,170	712,620	503,785
Indian Seas ,, ...	2	52	16	72	235	486	488	648	741	1,258	1,090,282	1,394,647
N. Pacific ,, ...	84	210	3	78	1	14	...	22	88	324	134,162	315,745
S. Pacific ,, ...	25	259	24	254	24	300	38	458	111	1,271	234,557	1,087,629
Total	16,617	7,308	20,175	8,097	638	2,535	1,485	2,486	18,915[2]	20,426	23,539,274	8,160,765

[1] It is to be observed that Heligoland and the Channel Islands are excluded from these Tables, being considered as parts of the United Kingdom.

[2] 1·444 British vessels passed through Suez Canal.

TABLE III.—*Number of British Vessels Entered to and Cleared from the United Kingdom (including repeated Voyages) in* BALLAST, *from and to Seaboards of the World, grouped by Ocean Districts, and in one Year only (1879), distinguishing Foreign from British Seaboard Commerce in those Districts, and also Steamers from Sailers; and showing Aggregate Total Tonnage of all.*

Ocean Districts.	From and to District Foreign Ports.				From and to District British Ports				Total entered and cleared to all Ports.		Total Aggregate Tonnage entered and cleared to all Ports.	
	Entered.		Cleared.		Entered.		Cleared.					
	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.
Northern Seas District...	2,526	678	346	335	[1]...	[1]...	[1]...	[1] ...	2,872	1,013	1,711,827	296,232
N.E. Atlantic ,,	3,084	1,701	842	599	10	2	2	3	3,938	2,305	1,588,165	288,486
N.W. Atlantic ,,	...	1	204	711	...	...	24	443	228	1,155	275,426	870,882
South Atlantic ,,	...	1	9	7	8	...	14	3	31	11	53,963	5,163
Indian Seas ,,	...	1	1	...	2	...	7	4	10	5	6,055	4,655
North Pacific ,,	...	...	7	...	...	...	...	...	7	...	3,706	
South Pacific ,,	...	...	4	...	...	...	6	1	10	1	3,864	714
Total	5,610	2,382	1,413	1,652	20	2	53	454	7,096	4,490	3,643,006	1,566,132

[1] It is to be observed that Heligoland and the Channel Islands are excluded from these Tables, being considered as parts of the United Kingdom.

TABLE IV.—*Showing Value of Trade of United Kingdom by Ocean District: also the Value of Indian and Colonial Trade* (exclusive of that with United Kingdom); *and further the Imperial Value of the Ocean District.*

—	North Seas.	North-west Atlantic.	North Pacific.	South Pacific.	Indian Seas.	South Atlantic.	North-east Atlantic.	Totals.
	£	£	£	£	£	£	£	£
United Kingdom trade (*vide* Table I)... ...	150,500,000	151,900,000	31,400,000	50,500,000	52,600,000	26,300,000	136,800,000	600,000,000
Indian and Colonial (exclusive of that with United Kingdom)	1,400,000	22,200,000	22,400,000	38,400,000	77,100,000	2,400,000	26,900,000	190,000,000
IMPERIAL VALUE ...	151,900,000	174,100,000	53,800,000	88,900,000	129,700,000	28,700,000	163,700,000	790,000,000

TABLE V.—*Showing Oceanic Accumulations caused by Movements of Commerce between the Hemispheres during the Year 1879.*

—	South Pacific.	Indian Seas.	South Atlantic.	North-east Atlantic.
	£	£	£	£
Imperial value (*vide* Table IV)	88,900,000	129,700,000	28,700,000	163,700,000
From and to North Pacific in transit, *viâ* Horn	5,000,000			
,, ,, ,, ,, Cape and Canal ...	...	26,400,000		
,, South Pacific ,, ,, ,, ...	...	23,500,000		
,, North and South Pacific in transit, *viâ* Horn ...				
,, North and South Pacific and Indian Seas in transit *viâ* Cape	...	...	33,500,000	
,, North and South Pacific and Indian Seas in transit *viâ* Canal	...	...	50,000,000 ...	82,600,000
Accumulated values caused by transit between hemispheres ...	93,900,000	179,600,000	112,200,000	246,300,000

TABLE VI.—*Weekly Average Number of Grain and Wool Sailing Ships on Passage to United Kingdom from three Ocean Districts in each quarter of the year.*

—	From North-east Atlantic.				From North Pacific.			From South Pacific.				Grand Total Weekly Average Number of Ships.
	With Wheat.	With Maize.	With Flour.	Total.	With Wheat.	With Flour.	Total.	With Wheat.	With Flour.	With Wool.	Total.	
1st Quarter of Year	26	30	6	62	154	9	163	66	...	138	204	429
2nd ,, ,,	42	42	8	92	91	12	103	149	3	156	308	503
3rd ,, ,,	71	78	5	154	41	7	48	123	4	58	185	387
4th ,, ,,	66	66	4	136	81	6	87	85	4	78	167	380

[1] For the three years 1878–79–80.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—C. Windham, C.V.O., to "Amphitrite"; F. T. Hamilton to "Bulwark"; H. C. Kingsford to "Furious"; R. K. McAlpine to "Monarch" for Ascension; L. G. Tufnel to "Boscawen"; T. H. M. Jerram to "Albion"; J. C. Graves-Sawle to "Aboukir"; H. E. P. Cust to "Triton"; L. C. Stewart, C.M.G., to "Vengeance"; W. S. Rees, C.B., to "Collingwood"; P. Bush to "Sutlej"; P. Hoskyns, C.M.G., M.V.O., to "Forte"; J. G. M. Field to "Katoomba" for Naval Establishment at Sydney; R. S. Lowry to "Hood"; C. G. Cradock to "Andromeda"; F. J. Foley to "Illustrious." Commanders—H. Jones to "Pomone"; W. H. Baker-Baker to "Medusa"; T. W. Kemp to "Sphinx"; G. C. Maresceaux to "Pactolus."

The Reserve Squadron, under the command of Vice-Admiral Sir G. Noel, K.C.M.G., has dispersed after their recent cruise, the ships proceeding to their respective ports for their annual refit; the officers and men of the "Revenge," Sir Gerard's flag-ship, have been temporarily turned over to the "Hercules" at Portsmouth, while the new casemates for the upper-deck guns are being fitted; similarly the "Thames" has been commissioned temporarily at Devonport to act as port flag-ship at Queenstown for the "Empress of India," while the casemates for her 6-inch guns are being fitted. The second-class cruiser "Iphigenia," lately returned from China with relieved crews, paid off on the 10th ult. at Portsmouth. The new first-class battle-ship "Bulwark" commissioned at Devonport on the 18th ult. for the Mediterranean, where she relieves the "Royal Oak," but when Sir Compton Domvile takes over the command of the station she will become the flag-ship in place of the "Renown." The first-class cruiser "Amphitrite" paid off at Chatham on the 20th ult., after her round of relief service and re-commissioned the following day for service on the China station. The third-class cruiser "Philomel" paid off at Devonport on the 22nd ult., and has been sent to Haulbowline for refit and repair. The third-class cruiser "Brisk" from China paid off at Malta on the 26th ult., where she will be repaired, her officers and crew being brought to England in the "Tyne." The first-class battle-ship "Irresistible," after having had the damage made good at Portsmouth caused by her collision with the Dutch collier "Clive" in a fog off Beachy Head on the morning of the 3rd ult., left on the 24th ult. for the Mediterranean. The first-class armoured cruiser "Aurora" arrived at Plymouth on the 26th ult. from China, and will pay off at Devonport. The first-class cruiser "Hawke" commissioned at Chatham on the 2nd inst. for relief service, and she will convey new crews for the second-class cruiser "Forte" and the gun-boat "Dwarf," both of which vessels are to re-commission at Simon's Bay. The new first-class cruiser "Aboukir" commissioned at Portsmouth on the 3rd inst. for service on the Mediterranean station, where she relieves the first-class cruiser "Theseus"; and her sister ship the "Sutlej" commissioned at Chatham on the 6th inst. for service in the Channel Squadron, where she takes the place of the first-class cruiser "Diadem."

Inward Turning Propellers.—The reasons for applying inward turning propellers to His Majesty's ships of war is not generally understood. Mr. Froude's experiments undoubtedly showed that a slight increase of speed was obtained under ordinary circumstances by the propellers revolving with their superior edges towards the run of

the vessel, when compared with an equal number of revolutions and similar propellers turning outwards; but this was not the chief gain in practice. The predominant superiority arose from another circumstance, namely, the better arrangements in the engine-room that can be obtained by causing the propellers to turn inwards, and the advantage arises in this way: the tendency to heat on the part of all bearings is more marked on the downward side to which the working parts go than on the side in which the motion is upwards; the weight of the parts and the constant action of gravity bring exceptional pressure to bear on the descending semi-circle of the revolution. Hence it is on that side that the greatest attention of the engineer in charge of the engines is demanded.

With engines so arranged as to work inwards, one central platform allows the engineer in charge to observe the dangerous side of each revolving shaft; with outward working propellers, not one central platform but two wing platforms, one on either side, become a necessity, and this again demands the attention of one supervisor to each shaft.

It is proved conclusively that vessels with inward turning propellers are absolutely under command as long as headway is gained or maintained, and it is only when starting from rest that the drawbacks accompanied with inward turning engines are in any way pronounced. As the efficiency of a fighting-ship is not lessened but increased when in motion, the Admiralty have of late universally adopted the inward movement; the cases in which service could be required from a vessel at rest are so limited that they are unworthy of consideration, but, as a matter of fact, we know by experience that under the most unfavourable circumstances of starting from rest, Admiralty vessels are handled with adequate success, even in the cases of ships of considerable length in proportion to their beam, and it is in long, narrow vessels that the power of the propellers causing the turning movement of the ship is less effective than in those of comparatively greater beam.

We are indebted to an officer, who has now had some considerable experience with these propellers, for the following remarks:—

"After longer experience I disapprove inward turning propellers. They answer perfectly when the vessel is under way, but the drawbacks in getting away from an anchorage cramped either by nature or by other vessels are very great. As far as my experience goes, the best way of turning short from rest is to go astern 20 yards, and then turn both engines full ahead with the helm hard over; I take her as far as the beach or other ships will allow; back her again and have another go; the objection to this is that with a hard wind and possibly a light ship, whilst backing for the second or third time, she always tries to get back to a position with the wind driving her bow to leeward. I was on one occasion an hour and a half in a roadstead, somewhat crowded and cramped, before I could get her head round against the wind. It came all right in the end, but it was a long and difficult job."

Turbine-driven Vessels.—The Admiralty have given orders for the construction on the Tyne of another turbine-driven torpedo-boat destroyer. In this connection it may be interesting to note the launch, on 11th February by Messrs. Hawthorn, Leslie & Co., at their Hebburn Yard, of a new destroyer named the "Velox," whose machinery is supplied by the Parsons Marine Steam Turbine Company at Wallsend-on-Tyne. The new vessel, which is generally of the same type as the unfortunate "Viper" and "Cobra," has not been built to the order of any Government; she is 210 feet long, 21 feet wide, and 12 feet 6 inches moulded depth. Special attention has been paid to the conditions necessary to secure longitudinal strength. The main propelling

machinery consists of two independent sets of Parsons turbine engines, one high-pressure engine and one low-pressure engine being on each side of the vessel. This gives four turbines, each of which has its own line of shafting, and, as each shaft carries two propellers, there are eight propellers in all. The high-pressure turbines drive the outer shafts and the low-pressure turbines the inner ones. For going astern reversing turbines are incorporated in the exhaust-casing of each of the low-pressure cylinders. A novel feature in this vessel is the introduction of ordinary reciprocating engines fitted in conjunction with steam turbines. These engines are of the triple-compound type, and are coupled direct to the main turbines and work in conjunction with them. They take steam directly from the boilers, and exhaust through the high-pressure turbine, the exhaust from the latter passing in turn through the low-pressure turbine, and thence to the condensers. These reciprocating engines are for use at cruising speeds, when low power only is needed, and are therefore of comparatively small size. All steam engines, including the steam turbine, do not show high efficiency when they are working much below the power for which they are designed, and as destroyers very seldom run at their top speed, they are apt to be wasteful of fuel during the greater part of their steaming. The new arrangement which Mr. Parsons has introduced should therefore be a distinct advantage. When higher powers than those needed for absolute cruising speeds, under ordinary conditions, are needed, steam will be admitted to the turbines direct from the boilers, and when the highest speed is needed, which would bring the rate of revolution beyond that permissible with reciprocating engines, steam will be entirely cut off from the latter, they being at the same time thrown out of gear, and the steam turbines alone would be used. With this arrangement the "Velox" will doubtless prove an exceptionally economical destroyer at cruising speeds.

The boilers are of the Yarrow type, and have been made by Messrs. Hawthorn. The trials of this vessel will be looked forward to with great interest.

Engineering, in a recent issue, gave some interesting details with regard to the "King Edward," an excursion steamer plying on the Fairlie-Campbeltown route, which is the pioneer vessel fitted with turbines for the mercantile marine, and, in order thoroughly to test her machinery and coal consumption, *data* have been carefully tabulated from her and from another Clyde passenger steamer of the same size named the "Duchess of Hamilton," thus giving a comparative statement of the two vessels for the "running" throughout the season. The table is as follows—

Comparative Statement of Speed, Mileage, and Coal Consumption of the paddle steamer "Duchess of Hamilton" and the s.s. "King Edward."

——	Duchess of Hamilton.	King Edward.
Total coal	1,758 tons 13 cwt.	1,429 tons 16 cwt.
Miles run	15,604	12,116
„ per ton	8·87	8·47
Number of days running...	111	79
Daily average consumption	15 tons 17 cwt.	18 tons 2 cwt.
Average speed	about 16½ knots.	about 18½ knots

On referring to the above table, it will be seen that the figures of coal consumption per mile are satisfactory, and also the *data* prove a decided victory for the steam turbine over the reciprocating engines, insomuch as although the "King Edward" is by far the faster boat, her consumption of coal per mile is almost as low as that

of the "Duchess of Hamilton." One of the chief advantages gained by the adoption of the turbine was the possible modification in the "model" of the boat, as finer lines could be introduced for speed purposes. The "King Edward" in this respect also, it is understood, has given entire satisfaction to her owners, and, not unnaturally, another boat of the same type, but 21 feet longer and with a speed of 21 knots, is being built, the Parsons Marine Steam Turbine Company being at present engaged on the machinery.

It is also worthy of notice that the class of craft being built with turbine machinery at the present time comprise three high-speed yachts of large size, one being of the torpedo-boat type with water-tube boilers, so, as is pointed out, the turbines will have every opportunity of appearing at their best.—*Times* and *Nature*.

Steam Trials.—The first-class armoured cruiser "Good Hope," built for the British Navy by the Fairfield Shipbuilding and Engineering Company (Ltd.), Glasgow, completed at the end of February a long and interesting series of trials at various powers and speed, and in view of the fact that she is the first of our armoured cruisers to maintain a speed of 23 knots, the results are important. The "Good Hope" is the first of the "Drake" class to be tried—she was delivered two months before the contract date—and the "Drake" left Pembroke Dockyard on Monday, 3rd March. The "Leviathan" was delivered from the Clydebank Works of Messrs. John Brown & Co. (Ltd.), on 10th March. The fourth vessel is the "King Alfred," also nearing completion at the Barrow Works of Messrs. Vickers, Sons & Maxim (Ltd.). These cruisers are 500 feet long, 71 feet beam, and 26 feet draught, and displace 14,100 tons. They are improved "Powerfuls," and, although of the same dimensions, have a 6-inch armour belt 11 feet 6 inches broad extending for the greater part of the length, but tapering to 4 inches and 2 inches forward, while aft there is a traverse or bulkhead 5 inches thick, and for the 105 feet of the stern of the ship unprotected by side armour, there is an extra thickness of protective deck. Unlike the "Powerfuls," they are not sheathed with wood and copper, and have no poop, while the boat deck is dispensed with and bulwarks amidships are substituted. Each has bow and stern chasing 9·2-inch guns in barbettes of 6-inch armour, with large gun-shields, sixteen 6-inch Q.F. guns in 6-inch armoured two-storeyed casemates, with a large number of smaller guns. There are 43 Belleville boilers, with economisers, supplying steam to two sets of four-cylinder, triple-compound engines, designed to develop together 30,000-I.H.P.; and throughout the trials everything worked most satisfactorily—a fact the importance of which will be more readily appreciated when it is stated that the official contract tests were carried out from day to day according to the original programme in an irreducible period of time; and the later series of progressive speed trials were delayed only one day, and that was owing to fog.

We tabulate the principal results of the three contract trials. The first, at one-fifth full-power, was of 30 hours' duration, and was to determine the radius of action for the coal supply carried—2,590 tons—and, as on this trial the rate of coal consumption was 1·87 lbs. per I.H.P. per hour, the ship may steam at 14 knots speed for 7,000 nautical miles. On the second trial, also of 30 hours' duration, the test was very severe. No war-ship has ever steamed for so long a time at this power—22,703-I.H.P.; but everything went splendidly, and the coal consumption, as shown in the table, worked out to 1·83 lbs. per I.H.P. per hour. At this power four runs were made over the deep-sea course between Rame Head and Dodman Point, when it was found that the mean speed was 22·09 knots, and this agreed with the observations of Captain

Wilson, who was in command, during the whole run, when the vessel went 60 miles west of the Scilly Isles.

On the 8 hours' full-power run there were on board Sir A. J. Durston, Mr. John List, a member of the Boiler Committee, and Captain Browning, one of the secretaries of the committee. The power developed on this run was 31,071-I.H.P., which is equal to 12·23-I.H.P. per ton of all machinery, and 47·6-I.H.P. per ton of boilers, results far in excess of those realised in ships with cylindrical boilers, while in Atlantic liners of corresponding speed the power per unit of weight of all machinery is only 6-I.H.P. per ton. The speed on this trial was 23·05 knots. This is the mean of mean results of five runs over the deep-sea course in a heavy swell, which was not conducive to high steaming. The power and speed anticipated were 30,000-I.H.P. and 23 knots. The coal consumption on this run was 1·92 lbs. per I.H.P. per hour, and it should be noted that all the water lost throughout all the trials was made in evaporators run by the exhaust steam from the 75 auxiliary engines on board the ship, thus effecting a great economy :—

——	First Trial.	Second Trial.	Third Trial.
Duration	30 hours	30 hours	8 hours.
Steam pressure in boilers	239 lbs.	268 lbs.	278 lbs.
Vacuum —starboard engine	25·5 inches	26½ inches	26½ inches
,, —port ,, ...	26·6 inches	27¼ ,,	27 ,,
Revolutions—starboard ,, ...	70·8	109	123·9
,, —port ,, ...	71·4	110·7	126·1
I.H.P. —starboard ,, ...	3,069	11,325	15,361
,, —port ,, ...	2,985	11,378	15,710
I.H.P. collective	6,054	22,703	31,071
Coal consumption	1·87 lbs.	1·83 lbs.	1·92 lbs.
Speed of vessel	14·5 knots	22·09 knots	23·05 knots.

Immediately after the contract trials there was a series of long-distance runs at progressive speeds, the deep-sea course of 22 knots west of Plymouth Sound being traversed three times at about 18 knots and three times at about 20 knots. On the first of these sets the mean of mean speed was 18·10 knots with the engines indicating 12,108-I.H.P., and on the second the result was 20·58 knots for 16,960-I.H.P. Having completed these runs on Wednesday, 26th February, the vessel headed up Channel for Spithead, as the subsequent speed trials at low powers were to be made over the measured mile at Stokes Bay ; and although it was a dark night, with a driving south-west rainstorm and by no means a smooth sea, a record trip for a war-ship was made, the time from outside Plymouth Breakwater to the Warner Lightship being slightly over six hours, giving a mean speed of nearly 20 knots. On the following day the "Good Hope" made four runs at 15 knots, 13 knots, and 10 knots speed at Stokes Bay. It was found that 2,689-I.H.P. gave 10·6 knots, 5,096-I.H.P. resulted in a mean of mean speed of 13·63 knots being got, while on the next series the average power was 7,953-I.H.P. and the speed 15·91 knots. There was also a very severe test of the steering machinery, which, with the anchor and capstan gear, was supplied by Messrs. Napier Brothers, of Glasgow. The ship was driven astern at 18 knots while the helm was kept at various degrees up to hard over, and the result was very satisfactory, the steering mechanism standing the test well. The ship returned on 27th February to Portsmouth Harbour to complete for sea, the long series of trials occupying only ten days, including a Sunday and a day of fog.

The torpedo-boat destroyer "Success," built and engined by Messrs. Doxford & Sons, Sunderland, has carried out at Portsmouth her 3 hours' 30-knot full-power trial quite satisfactorily. She had 254 lbs. of steam in her boilers and a mean air pressure of 5·7 inches. The I.H.P. was 6,597, and the mean of six runs over the measured mile showed a speed of 29·908 knots, while the mean speed of the 3 hours was 30·023 knots. —*Times.*

Gunnery on the China Station.—The complete returns of the prize-firing in 1901 by the twenty-eight ships on the China station have been issued, and the results show that the heavy guns fired 2,715 rounds, making 1,072 hits, or a percentage of hits to rounds of 39·48. In order of merit the "Terrible" stands first, her 9·2-inch Mark VIII. guns making 14 hits in 22 rounds, and her 6-inch Q.F. guns 102 hits in 128 rounds. The total points made were 1,433·5, or 102·4 points per gun. The "Barfleur's" 10-inch guns fired 47 rounds and made 23 hits, and her 4·7-inch guns made 114 hits in 159 rounds. She scored 1,314·13 points, or 93·87 points per gun. The "Ocean's" record of 14 hits in 26 rounds with the 12-inch breech-loading gun stands out in contrast with the "Glory's" 7 hits for 28 rounds and the "Goliath's" 5 for 22, while the "Ocean's" 6-inch guns made 64 hits in 115 rounds, thus securing her third place in order of merit with 1,047·89 points, or 65·5 points per gun. The "Astræa" fired 21 rounds from her 6-inch guns, and scored 14 hits, and her 4·7 inch guns made 48 hits in 136 rounds. Her total points were 628·1, or 62·8 points per gun. The "Isis" fired 43 rounds with her 6-inch guns, and made 25 hits, and with her 4·7-inch guns made 36 hits for 79 rounds, scoring 648·34 points, or 58·94 points per gun. The "Bramble's" two 4-inch guns made the creditable score of 13 hits for 22 rounds, or 57·2 points per gun. The "Centurion" in 35 rounds from her 10-inch guns scored 9 hits, and her 4·7-inch guns 69 hits for 116 rounds, thus making 746·43 points, or 53·3 points per gun. None of the other ships made 50 points per gun, while the "Britomart's" two 4·7-inch guns made only 1 hit in 19 rounds, or a total of 8·8 points, making 4·4 points per gun. The best results obtained with each class of gun were as follows:—

Gun.	Ship.	Hits per Gun per Minute.
12-inch B.L.	Ocean	·58
10-inch B.L.	Barfleur	·48
9·2-inch Mark VIII.... ...	Terrible	1·16
3·2-inch Mark VI.	Orlando	·83
6-inch Q.F.	Terrible	4·25
6-inch Q.F.C....	Arethusa	1·4
5-inch B.L.[1]	Daphne	·21
4·7-inch Q.F.	Barfleur	5·7
4-inch Q.F.	Bramble	3·25
4-inch B.L.	Plover	·42

[1] The only ship with these guns.

In the competition with light Q.F. guns the "Terrible" again heads the list with the 12-pounder. She fired 136 rounds, and made 72 hits, or 4 hits per gun per minute, the "Handy" giving the same average with only 10 rounds. The "Isis" made 3·1 hits per gun per minute in 72 rounds, and the "Dido" in 3 more rounds made 3 hits less, or 2·7 hits per gun per minute. The most rapid-firing gun was the "Handy's," which got through the 10 rounds from her one gun in 1 minute; and next in order of rapidity came the "Talbot" with 9 rounds per minute, so that with 27 hits for 90 rounds she scored 2·7 hits per gun per minute. The "Goliath" also hit the target 27

times, but fired 104 rounds at the rate of 8·7 rounds per minute, giving each gun an average of 2·25 hits per minute; and the "Ocean" produced the same mean, making the same number of hits with only 87 rounds, but her rate of firing was much slower, being 7·25 rounds per minute. The "Bramble" made 2 hits per gun per minute, the "Britomart" 1·5, the "Glory" 1·4, and the "Argonaut," though she fired only 87 rounds from her 14 guns at the rate of 6·2 rounds per minute, scored the small result of 14 hits, or one hit per gun per minute. In the 6-pounder and 3-pounder competition 23 ships fired 1,973 rounds with 414 hits, the "Isis" coming out first with 31 hits for 72 rounds, firing at the rate of 1 round per gun every 5 seconds, and scoring 5·1 hits per gun per minute, while the "Glory" comes out last with a mean of ·67, making only 4 hits for 51 rounds, and firing at the rate of 8·5 rounds per gun per minute. In the ·45-inch machine-gun competition the Nordenfelt made the best and the worst score, the "Pique," in 420 rounds, getting in 30 hits per gun per minute, while the "Alacrity" fired 140 rounds and missed the target every time. Twenty-two ships competed, and there were 1,022 hits for 22,124 rounds. The "Terrible," using the Maxim, made the most rapid firing, discharging 3,115 rounds at the rate of 346·1 rounds per gun per minute, and her score per gun per minute was 9·1 hits. The "Alacrity" and the "Orlando," both using the Nordenfelt, were the slowest, each firing at the rate of 70 rounds a minute, but for every 70 shots the "Orlando" hit the target 25·3 times. Only the "Glory" and "Endymion" fired the ·303 machine gun, securing between them 205 hits in 3,470 rounds, the "Glory" making 13·9 hits per gun per minute, and the "Endymion" 13·4. The 1-inch Nordenfelt competition was confined to the "Arethusa" and "Redpole," and there were 15 hits for 82 rounds, the "Arethusa" scoring 10 hits per gun per minute, and the "Redpole" 2·5.

Coaling War-ships at Sea.—The battle-ship "Trafalgar," Captain G. A. Primrose, during the recent cruise of the Reserve Squadron, continued the experiments with the Temperley-Miller transporter for coaling ships at sea. Before the squadron left Portland, Vice-Admiral Sir G. H. Noel, Admiral-Superintendent of Naval Reserves, went on board the collier "Muriel," which has been fitted up with the coal transporting apparatus, a description of which has already appeared in the *Times*, and when the squadron left Portland the "Trafalgar" took the "Muriel" in tow. At a speed of about 10 knots, the course was altered several times to test the strain on the cable-way, and then coaling began. During this operation the squadron of 17 ships, in two lines, passed on either side of the "Trafalgar" and "Muriel" to afford the officers an opportunity of witnessing the work, and a few days later the experiment was repeated. As it was not considered advisable to interfere with the programme of the cruise, it was not necessary to complete the coaling of the battle-ship, but the trial was rather intended to test the practical working of the machinery, and at each trial coal was transshipped at the rate of 35 tons an hour. When the squadron left Jersey, Vice-Admiral Noel directed the experiment to be made with the "Empress of India," and the gear was transferred from the "Trafalgar" to that ship and expeditiously erected. The experiment was a highly practical ene, for beyond witnessing the operation in the "Trafalgar," the officers of the "Empress of India" had no experimental knowledge of the apparatus. As soon as the battle-ship had taken the collier in tow the former steamed ahead at 10 or 11 knots, and during this part of the test she suddenly altered course eight points, and the towing-line and cable-way answered so well that not a strand gave out. Coaling then took place, and 21 tons were transferred in 33 minutes, giving a rate of 40 tons an hour. As in the preliminary trials with the "Trafalgar," only six bags were transported at a time, but should further trials be ordered the

number will be increased to eight bags, and it is anticipated that the shipment will exceed 50 tons an hour. During the experiment with the "Empress of India" there was a moderate sea and a wind force of five, and the result was regarded as so highly satisfactory as to suggest a further development of the invention. A collier of sufficient power would be able to tow the war-ship so that the whole of the coal transshipped would go into her bunkers instead of being partly used in the furnaces—that is to say, assuming the war-ship burns 5 tons an hour and ships 40, the replenishment of her bunkers amounts to only 35 tons an hour. Secondly, an opportunity would be afforded the war-ship of sweeping tubes, cleaning fires, and carrying out any necessary repairs to the machinery; and, thirdly, a war-ship could be towed at so slow a speed that it would not be necessary to remove her far from her base of action, whereas, owing to the lightness of the collier under present conditions, a speed of from 8 to 10 knots is advisable in order to keep the cable-way taut and to prevent the collier from drifting under the stern of the towing war-ship. Captain A. R. Wonham, who is in charge of the experiments, reported the results at the Admiralty, and further trials will now probably be ordered, the practicability of coaling at sea having been fully demonstrated.—*Times.*

Naval Expenditure and Mercantile Marine (Great Britain, etc.).—Return, showing Aggregate Naval Expenditure on Seagoing Force; Aggregate Revenue; Aggregate

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
BRITISH EMPIRE	£	£	Tons.	Tons.	Tons.	£	£
United Kingdom	28,478,843 (a)	130,384,684 (Year ended 31st March, 1901)	9,304,108 (b)	49,300,887 (c)	54,425,866	562,588,336	386,345,793
India	413,747 (d) (e) (1899-1900)	68,637,164 (d) (Year ended 31st March, 1900)	61,606 (f)	4,157,138 (Year ended 31st March, 1900)	12,648,715 (Year ended 31st March, 1900)	64,185,444 (d) (Year ended 31st March, 1900)	78,026,473 (d) (Year ended 31st March, 1900)
SELF-GOVERNING COLONIES (p)							
Australian Commonwealth: (r)							
New South Wales... ...	47,831 (w) (1899-1900)	10,201,440 (Year ended 30th June, 1900)	131,783	3,920,801	No Returns	24,080,986	22,315,377
Victoria ...	59,401 (g) (1899-1900)	7,427,820 (Year ended 30th June, 1900)	101,135	2,944,192	470,146	15,538,649	15,246,169
South Australia (except Northern Territory)	17,594 (1899-1900)	2,829,462	46,085	1,772,253	No Returns	5,464,706	6,908,064
Northern Territory		72,471 (Year ended 30th June, 1900)	742	71,715	No Returns	130,382	121,434
Western Australia ...	4,732 (1899-1900)	3,010,005	12,517	1,606,332	No Returns	5,962,178	6,852,054
Tasmania ...	4,970 (1899)	1,054,980	15,783	613,955	No Returns	2,073,657	2,610,617
Queensland ...	34,796 (v) (1899-1900)	4,588,207 (Year ended 30th June, 1900)	21,083	819,662	3,791,220 (h)	6,713,615	8,765,063
New Zealand (r)	20,924 (1899-1900)	5,651,781 (Year ended 31st March, 1900)	98,753	825,275	6,870,655	10,646,096	13,246,161
African—							
Natal	— (s)	1,886,710 (Year ended 30th June, 1900)	2,357	1,405,180 (i)	No Returns	6,694,501 (l)	1,125,337 (k)
Cape of Good Hope	30,000 (t)	6,236,210 (Year ended 30th June, 1900)	2,637	4,701,536 (o)	4,558,851	19,677,872 (l)	8,147 (q) (k)
American—							
Dominion of Canada ...	—	10,549,885 (Year ended 30th June, 1900)	639,284	6,912,400 (m) (Year ended 30th June 1900)	16,386,036 (m) (Year ended 30th June 1900)	38,963,530 (n) (Year ended 30th June 1900)	39,430,423 (n) (Year ended 30th June 1900)
Newfoundland	—	433,898 (Year ended 30th June, 1900)	112,221	707,286 (Year ended 30th June 1900)	No Returns	1,540,510 (Year ended 30th June 1900)	1,772,790 (Year ended 30th June 1900)

Tonnage of Mercantile Marine; Annual Clearances of Shipping in the Foreign Trade; Annual Clearances of Shipping in the Coasting Trade; Annual Value of Imports by Sea, including Bullion and Specie; and Annual Value of Exports by Sea, including Bullion and Specie, of various countries, exclusive of China and South American Republics, but including British Self-governing Colonies, for the year 1900.

NOTE.—Except where otherwise stated, the figures refer to 1900. Where it has not been possible to give the particulars for 1900, the figures for the latest year available have been shown.

REMARKS.

(a) Of this total £26,979,945 was ordinary expenditure, and £1,498,898 was expenditure under the Naval Works Act, 1899 (outside Naval Votes).

(b) Including the Isle of Man and Channel Islands.

(c) The tonnage of vessels employed by H.M. Government in the conveyance of troops, stores, etc., to South Africa is not included.

(d) The rupee has been converted into sterling at the official rate for the year of 1s. 4d. the rupee.

(e) Includes (1) £100,153 contribution towards His Majesty's ships on the East Indian Station, and (2) £59,600 subsidy to the Admiralty for manning and maintaining "His Majesty's ships and vessels for the Naval Defence of India." The balance represents expenditure on the Marine Department. The annual contributions payable by the Indian Government are (1) £100,000, and (2) £61,600.

(f) In addition to the vessels registered under the Imperial Act of 1894, India owns some vessels of small tonnage registered under the Indian Act X. of 1841; these are not included in the table.

(g) Exclusive of expenditure on naval buildings and vessels which is included in a sum of £6,494 expended for defence works and buildings, and is not separately distinguished.

(h) Inclusive of the tonnage of vessels (2,574,014 tons) engaged in coasting voyages terminating beyond the Colony.

(i) Exclusive of the tonnage of transports.

(k) Including the value of gold, the produce of South African States, brought into the Colony overland, and exported by sea.

(l) Including the value of goods entered for removal to other South African States.

(m) Exclusive of the tonnage of vessels (6,300,050 tons) trading on the rivers and lakes between Canada and the United States.

(n) Total Imports and total Exports. Imports and Exports by sea are not separately shown in the Canadian returns.

(o) Inclusive of the tonnage of transports carrying stores, but exclusive of the tonnage of those conveying troops.

(p) The revenues of these Colonies are exclusive of loans raised.

(q) The exports of raw gold decreased from £13,815,683 in 1899 to £336,795 in 1900.

(r) Includes contributions towards the maintenance of His Majesty's vessels for protection of floating trade in Australasian Waters, as follows, for 1899-1900 :—

New South Wales ...	£37,886	Queensland	£13,585
Victoria	33,140	New Zealand	20,924
South Australia	10,355		
Western Australia ...	4,732	Total ...	£125,532
Tasmania	4,910		

The annual contribution is £126,000, payable in advance. It was apportioned amongst the various States of the Australian Commonwealth and New Zealand on a population basis for the year commencing 1st April 1901, as follows :—

New South Wales ...	£37,549	Queensland	£13,787
Victoria	33,289	New Zealand	21,452
South Australia	10,067		
Western Australia ...	5,068	Total ...	£126,000
Tasmania	4,788		

(s) A gift of 12,000 tons of coal for the use of His Majesty's ships, etc., is made annually by the Natal Government.

(t) A sum of £30,000 is paid annually by this Colony towards the Expenditure by the Imperial Government in connection with His Majesty's Naval Service.

(v) Includes £7,386 on account of 1898-99.

(w) Estimates 1899-1900.

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted either from Board of Trade Returns or from the Official Returns of the various Colonies.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
	£		Tons.	Tons.	Tons.	£	£
Russian Empire	8,662,801*	190,078,000	633,821	8,340,432 (a)	20,628,161 (a) (1899)	36,003,000 (b) (c) (1899)	40,402,000 (b) (c) (1899)
Germany ...	7,472,656† (Year ended 31st March, 1901)	89,008,000 (1900-1)	1,941,645	14,108,162 (1899)	3,918,269 (1899)	320,306,000 (d)	255,072,000 (d)
Netherlands ...	1,360,659	12,922,000	346,997	9,119,891	—	Metric Tons. 13,271,000 (e)	Metric Tons. 2,564,000 (e)
France	12,055,492	145,494,000	1,037,726	19,333,545	7,199,827 (1899)	£ 179,404,000	£ 153,901,000
Portugal ...	507,430 (Year ended 30th June, 1901)	11,742,000 (1900-1)	129,180 (1899)	9,978,553	1,256,048 (f)	8,347,000 (b) (1899)	6,056,000 (b) (1899)
Spain	1,000,119 (Year ended 30th June, 1901)	35,440,000 (1899-1900)	774,579	14,066,948	10,398,025 (1899)	31,722,000	27,967,000
Italy	4,903,109 (Year ended 30th June, 1901)	69,654,000 (Year ended 30th June, 1900)	873,054 (1899)	20,080,840 (g)	10,067,615 (g)	49,239,000	30,112,000
Austria-Hung'y	1,644,437	Austria. 66,795,000 1899) Hungary. 49,877,000	Austria. 198,322 Hungary. 66,344	Austria. 12,640,984 Hungary. 2,128,595 (1899)		13,399,000 (b)	12,705,000 (b)
United States (Year ended 30th June)	13,385,574 (1900-1)	139,499,000	826,694 (h)	23,617,658 (i)	—	177,492,000	288,030,000
Japan	4,077,553 (Year ended 31st March, 1901)	25,809,000 (k) (Year ended 31st March, 1901)	796,930 (l) (1899)	4,008,567 (1899)	4,594,860 (1899)	25,876,000 (m) (1899)	23,624,000 (m) (1899)

REMARKS.

NOTE.—The *actual* Naval Expenditure for any year is seldom known—never immediately—the figures given, therefore, are the sums voted. With regard to the revenue and commerce of foreign countries, in converting the foreign currencies into £'s sterling the par value of the foreign money has been taken.

* In addition to the ordinary estimates, a sum of £11,500,000 allotted in 1897 and 1898 is being spent on naval expansion.

† The cost of the maintenance of the forts at naval ports is included.

(a) The figures refer to Russia-in-Europe and the Caucasian ports of the Black Sea.

(b) Special Trade, *i.e.*, Imports for Home Consumption or Exports of Domestic Produce or Manufacture, as the case may be.

(c) Trade by European sea-board, including also Finland.

(d) Total Trade. Imports and Exports by Sea are not separately distinguished.

(e) The particulars as to *value* of trade by sea are not available.

(f) Portuguese vessels only.

(g) Certain vessels formerly included in the Coasting trade are now classed under the head of "Liners" and included in the Foreign Trade.

(h) Registered for over-sea (*i.e.*, Foreign) Trade only.

(i) Exclusive of the tonnage of vessels engaged in the Lake trade (4,663,483 tons) between the United States and Canada.

(k) Includes the Chinese indemnity.

(l) The tonnage of Japanese vessels is the *gross tonnage* of vessels of foreign type, excluding Junks. In 1899 certain sailing vessels of half-foreign and half-Japanese type have also been included.

(m) Including Formosa.

NOTE.—The above particulars with regard to Naval Expenditure have been furnished by the Admiralty. The remaining particulars have been extracted from the Official Returns of the various countries mentioned, except in the case of Spain and Portugal, for which countries certain figures have been extracted from the "Almanach de Gotha."

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admiral—E. A. Maréchal to be Commander-in-Chief of the Squadron in the Far East. Capitaines de Vaisseau—A. A. L. Bonifay to "Redoutable"; J. Baëhme to "Guichen"; G. P. Simon to "Dévastation"; A. Schlumberger to "Dupleix." Capitaines de Frégate—J. B. P. Arden to be Capitaine de Vaisseau; P. Garnault to command of Mine Defence at Rochefort; J. M. Farques to "Dragonne" and *Défense-Mobile* at Toulon.—*Journal Officiel de la République Française.*

Vice-Admiral Roustan, the Maritime Prefect of Brest, is to command the squadron which will escort the President of the Republic on his visit to Russia, which will now probably consist of the new first-class armoured cruiser "Montcalm," the first-class cruiser "Guichen," which commissioned at Brest on the 25th ult., and the torpedo-avisos "Cassini" and "Yatagan." It is probable that the squadron, in order to avoid the necessity of recoaling in the Russian port, will assemble at Dunkirk, where the President will embark. Vice-Admiral Maréchal has been selected to succeed Vice-Admiral Pottier in command of the Fleet in Chinese waters; he proceeds to his station by the mail steamer leaving Marseilles on the 30th inst., and will hoist his flag on board the second-class battle-ship "Redoutable" on his arrival at Saigon.

Re-organisation of Foreign Squadrons.—The Minister of Marine has considerably modified the organisation of the French squadrons on the more distant stations, there having been naval divisions in the Far East (China), Cochin-China, the Indian Ocean, and the Pacific. It has been held for a long time in responsible circles that these divisions, owing to their weakness, would, in the event of hostilities breaking out, be either destroyed or shut up in port, unable to move.

M. de Lanessan, without increasing the number of ships maintained on those stations, is about to establish a new system of distribution by utilising as bases of operation the ports of Saigon, Diego Saurez, and Nouméa, at all of which defence works are in course of construction. The four divisions just referred to are to be suppressed and re-organised as the naval force of the Eastern Seas. This fleet is to consist of two divisions, consisting of six modern cruisers, with some light vessels and river gun-boats for coast and river work, and some torpedo-boats and submarines, with a Reserve Division of coast-defence battle-ships and some transport-avisos. The fleet will be under the command of a vice-admiral, with a rear-admiral as his second-in-command. It is believed that although the fleet will have to operate over a large area, it will be able to concentrate on any threatened point more rapidly than the time occupied in sending reinforcements to China during the crisis of two years ago. Moreover, the real naval region of interest for France, outside of Chinese and Japanese waters, is entirely included within the triangle formed by the routes uniting the three bases, viz., Saigon, Diego Saurez, and Nouméa.

The new fleet will, it is believed, be constituted as follows :—

First Division.

First-class armoured cruiser—"Montcalm" (flag-ship of Commander-in-Chief).
First-class cruisers—"Chateaurenault," "Guichen."
Second-class cruisers—"Jurien de la Gravière," "Friant," "Bugeaud."

Second Division.

First-class cruiser—"D'Entrecasteaux" (flag-ship of Second-in-Command).
Second-class cruisers—"Sfax," "Pascal," "Catinat."
Third-class cruisers—"Infernet," "D'Estrées."

Coast and Rivers Division.

First-class despatch-vessel—"Kersaint."
First-class gun-boats — "Surprise," "Décidée," "Zélé," "Lion," "Vipère," "Aspic," "Scorpion," "Comète."
Second-class despatch-vessels—"Alouette," "Bengali."
River gun-boats—"Argus," "Vigilante," "Olry," "Takiang."
Transport-avisos—"Rance," "Nièvre," "Durance," "Meurthe."

Reserve Division.

Coast-defence battle-ships—"Redoutable," "Vauban."
First-class armoured gun-boats—"Styx," "Achéron."
Pontoons—"Triomphante," "Bayard."

Vice-Admiral Maréchal and Rear-Admiral Bayle, the Commander-in-Chief and Second-in-Command of the fleet at present in China, respectively, are to hold the same positions in the newly-constituted fleet; Vice-Admiral Maréchal's present flag-ship, the "Redoutable," being relegated to the Reserve Division at Saigon.

The Estimates and Parliament.—Last month the Chamber agreed to the amendment of M. Aimond requiring the replacing on the list of new construction for the current year of the three battle-ships and thirteen submarines of the programme of 1900, which had been struck out by the Commission of the Budget of the Navy. These three battle-ships caused a conflict of opinion between the Naval Department and the Commission of the Budget, the latter considering that were they ordered at once it would be tantamount to accepting a loan from the contractors, as no money was provided. The period of completion of the 1900 programme having, however, been put forward one year by the Chamber, namely, 1906 instead of 1907, obliged the

Naval Department to hasten the commencement of these three ships, as if the new programme is to be completed within the time it was necessary for the contracts and preparations for the construction of these ships to be commenced at once.

For the first time the Naval Department now finds itself in a position to complete with all despatch one of the numerous programmes of new construction which at different times have been undertaken.

The programmes of 1891 and 1896 were arrested almost in the second year of their existence: the Budget of 1894 destroyed the programme of M. Barbey and that of 1896, which had never been properly put before Parliament, had a still shorter existence. The programme of 1900 has now just narrowly escaped sharing the same fate.

The present condition of the 1900 programme, which ordered the construction of 177 vessels, *i.e.*,

6 battle-ships
5 armoured cruisers
28 destroyers
112 torpedo-boats
26 submarines

is as follows :—

6 battle-ships
5 armoured cruisers
22 destroyers
41 torpedo-boats
44 submarines

Total ... 118

These vesels have been commenced, or ordered, and it appears, therefore, as if the programme would be completed in time, with the exception, possibly, of the torpedo-boats, of which 71 have still to be commenced: against this, however, may be set the good progress made with the submarines, 44 of which have been commenced, whereas the original number authorised was but 26.

Dockyard Notes and New Ships.—There is not very much of importance to record this month.

Cherbourg.—Torpedo-boat No. 223 was launched at this port on 12th March; she is the first French torpedo-boat constructed in a Government yard, hitherto these small craft have all been built in private yards by contract. M. Lockroy, when Minister of Marine, thinking it advisable that the Government arsenals should have experience in the construction and repair of torpedo-boats, so that the Navy should not be entirely dependent on private firms in this respect, ordered the necessary machinery and tools to be provided.

No. 223, the boat just launched, was ordered to be laid down on the 27th April, 1897, but a commencement was not actually made with her until the 3rd September, 1900, and she should have been completed last year. It is hoped that no such long delay in construction of these vessels will occur in the future, as the dockyard is now provided with the necessary plant, and a staff specially trained for torpedo-boat building. There are six of these boats altogether under construction in the dockyards, Nos. 223 (already mentioned) and 224, building in this yard; Nos. 225 and 226 at Toulon; Nos. 244, already launched and completing at Saigon, and P 96 at the same yard.

They are all first-class boats of 84 tons displacement, with a length of 37 metres (121 feet), and will carry two 37-mm. (1·4-inch) Q.F. guns.

The coast-defence battle-ship "Requin," which ought before this to have proceeded to Toulon to join the Reserve Division at that port, is still detained, as the necessary staff of officers is not available, at present, to navigate her round. The present dearth of officers is becoming a positive danger to the efficiency of the fleet.

Brest.—The first-class cruiser "Guichen" commissioned here on the 24th ult.: she is being rapidly fitted up to convey part of the President's staff on his impending visit to Russia. The new first-class armoured cruiser "Montcalm" arrived at Brest on the afternoon of Sunday, the 30th ult., having made the passage in 4 days and 6 hours, at an average speed of 18 knots. The "Montcalm" is fitted to serve as a flag-ship, and her complement has been fixed at 30 officers and 540 men.

Work is being pushed on with both the new first-class battle-ship "République," and the armoured cruiser "Léon Gambetta": and the best part of the frame of the first-named ship is now in place.

On the 6th ult., an order came down in the early morning from the Ministry of Marine to mobilise all the first-class torpedo-boats attached to the *Défense-Mobile*, with the torpilleur-de-haute-mer "Lancier," and the torpedo-aviso "Salve," which carries the senior officer's pennant of the flotilla: the flotilla left the harbour just before midday and proceeded to sea, where, in spite of the thick weather, they were exercised all the afternoon at tactics, anchoring at Lauberlach for the night, and after another day's exercising, returning to port, when they were demobilised.

Lorient.—The second-class cruiser "Isly" and the transport-aviso "Manche" have been commissioned for the Fishery Service off Newfoundland and in Icelandic waters.

It has been found necessary to demand from Brest the stokers necessary to carry out the trials of the new fast second-class cruiser "Jurien de la Gravière," there being none to spare for this duty at the port. As her boilers are of the small tube, Du Temple-Guyot type, which have given such trouble in the "Jeanne d'Arc," some fears are expressed as to the results of the ship's forthcoming trials: but as some important modifications have been introduced, notably the fitting of automatic feed-supply regulators, it is hoped they will pass off satisfactorily.

Great progress has been made with the new first-class armoured cruiser "Condé" since she was launched last month, and the authorities hope she will make a record in her completion; at the time of her launch, although as far advanced as the "Gloire" when she took the water, yet the work had been carried out in only 350 days, as against 450 for the latter ship; this is due to the fact that being a sister ship to the "Gloire," the work proceeded far more rapidly from the experience gained in the construction of the latter, on board of which also now the work is progressing favourably; her engines are in place, as are also the turrets for her 6·4-inch Q.F. guns.

Rochefort.—The new first-class armoured cruiser "Dupleix" was commissioned on the 15th ult. for her trials. She is the first to be ready of three vessels of a similar type, the other two being the "Desaix," under construction at Saint-Nazaire, and the "Kléber" at Bordeaux; all three vessels are intended for service on foreign stations. "They are really rather large 'Dupuy de Lômes,'" says the *Yacht*, "but they do not show any remarkable advance on that ship, which was launched more than twelve years ago. The principal advantage they seem to possess over their prototype is that they ought to be more habitable in hot climates. Nevertheless, we may ask whether it is still not possible to give them a more powerful armament. They have a displacement of 7,700 tons, as against 6,250 of the 'Dupuy de Lôme,' but their armour protection is very little better; their speed should be 21 knots, but the 'Dupuy de Lôme' with her new boilers will probably equal that; their coal supply is 1,200 tons, the 'Dupuy de Lôme' can carry as much. The 'Dupleix' carries ten 16·4-cm. (6·4-inch) Q.F. guns, the 'Dupuy de Lôme' carries six 16·4-cm. guns and two 19·4-cm. (7·6-inch) guns, the former's guns being the more powerful, as they are of the latest model; on the other hand, the 'Dupuy de Lôme' only cost 10,500,000 francs,

as against 16,308,847 francs for the 'Dupleix,' and the largely increased cost of the latter is hardly compensated for by the very slight superiority she possesses."

The second-class cruiser "Davout," which has undergone a complete refit, is before the end of the year to relieve the "Suchet," a sister ship in the Atlantic Division; owing to defects in her habitability the "Davout" is not well fitted for service on a hot station.

The submarines on trial and under construction at this port will have two stations—one here, the other at La Pallice, but they will nevertheless form only one group under the same commander, and the group will be known as the Rochefort-La Pallice one.

Saint-Nazaire.—The first-class armoured cruiser "Amiral-Aube" is to be launched at this port on 9th May; she is a sister ship to the "Condé," recently launched at Lorient, and is the last of the five armoured cruisers laid down in accordance with the 1896 programme of construction, the other three, which are of the same class, being the "Sully," "Gloire," and "Marseillaise." They are improved "Montcalms," a little larger, with somewhat better protection for the guns. The "Montcalm" class carry their guns in casemates with unprotected bases, while the "Condé" and her sisters carry their guns, partly in casemates, which have their bases protected, and partly in closed turrets. Her displacement is 10,014 tons, length 138 metres (452 feet); beam, 20·20 metres (66 feet). Her engines are of 20,500-H.P. driving three propellers, and her estimated speed is 21 knots. She can carry 1,500 tons of coal, giving a radius of action at 10 knots of 10,400 miles, and at full speed of 1,940 miles. Her armament comprises:—Two 194-mm. (7·6-inch), eight 164-mm. (6·4-inch), six 100-mm. (3·9-inch), eighteen 47-mm. (1·8-inch), and four 37-mm. (1·4-inch) guns, and she has five torpedo-tubes, two of which are to be submerged. Her complement is fixed at 25 officers and 590 men, and her total cost is 24,985,682 francs (£999,427). She is to be completed by June, 1903.

Toulon.—There is nothing of importance to record from this port.—*Le Yacht* and *Le Temps.*

JAPAN.—*The Trials of the "Mikasa."*—The new battle-ship "Mikasa," built by Messrs. Vickers, Sons & Maxim (Ltd.) at their Naval Construction Works at Barrow-in-Furness, for the Japanese Navy, after completing her official trials in the English Channel, left Plymouth on the 13th ult. for Yokohama. On a deep-sea measured course off the coast of Devon the vessel attained a speed of 18·6 knots, developing a mean I.H.P. of 16,400, which is in excess of the guaranteed results—namely, 18 knots and 15,000-I.H.P. On a coal-consumption trial of 6 hours' duration of four-fifths of the full power it was found that with 12,235-H.P. the coal consumption worked out to 1·53 lbs. per unit of power per hour, while the guarantee was 2 lbs. The boilers, which are of the Belleville type, were worked entirely by the Japanese crew. On the 6 hours' trial the speed was 17·3 knots. The engines worked most satisfactorily on all the trials. Progressive speed trials were made on the measured mile course at Stokes Bay, and amongst the results obtained were that 10 knots could be maintained for 2,000-I.H P., and 15 knots for a fraction under 7,000-I.H.P. The ship was at her full draught of 27 feet 2 inches on an even keel, the displacement being 15,200 tons, and on the circling trials it was found that the diameter of the circle turned, as measured by a Barr and Stroud range-finder, was only 1½ times her length, which is 400 feet, her beam being 76 feet.

All the guns and torpedoes were tried, these including four 12-inch guns and fourteen 6-inch guns, with twenty 12-pounders, eight 3-pounders, four 2½-pounders

and four submerged torpedo-tubes. But the interesting feature of the ship is probably the disposition of her armour. Instead of adopting the scattered casemate system, as in recent battle-ships, Messrs. Vickers, Sons & Maxim, in the design of this ship, have adopted concentrated casemates within the central battery, and there is no unprotected space on the broadside between the casemates. Such unprotected sides, where existing, may admit projectiles to the interior of the ship, which might do considerable damage to the comparatively unprotected rear of the casemate guns on the other side of the ship. This arrangement secures the combined advantage of complete isolation for each of the 6-inch guns, along with a continuous armour-plated side for the full depth of the ship throughout a great part of her length, thus ensuring an armoured reserve of buoyancy and stability. In other words, should the ends of the ship be riddled by shot, admitting water and increasing the draught, the remaining freeboard, being armoured, ensures extra buoyancy. This system is unique. All auxiliary machinery on board the ship was tested during the course of the trials and found satisfactory.

The gun and torpedo trials were attended by certain features of rather peculiar interest. All the guns and torpedo fittings were supplied by Sir W. G. Armstrong, Whitworth & Co., whose representatives had charge of the armament trials. It is unnecessary to dwell on the trials of the fourteen 6-inch and thirty-two smaller Q.F. guns, beyond saying that two rounds were fired from each of these guns without hitch or difficulty. From the submerged torpedo-tubes, which were of the usual Elswick type, ten rounds were fired, of which six were fired with the ship steaming at speeds varying from 15 to 17 knots. These trials also passed off without any difficulty. The hydraulic machinery for working the 12-inch guns in their turrets included several new arrangements tending to improve the rapidity of firing. To make the trial thorough, it was arranged to fire the guns in the after turret for rapidity without aiming at a target; while the rounds from the guns in the fore turret were to be each aimed deliberately, but also fired with as much rapidity as was consistent with good shooting. The result fully realised all anticipations. From the after turret the best result was 30 seconds for loading after firing. This is an improvement of about 12 seconds on any previous record. Other good intervals were 39 seconds and 40 seconds. Firing, as in these cases, unaimed rounds is more a theoretical than a practical trial of efficiency. It is, therefore, the firing of the aimed shots from the fore turret which should prove of the more practical interest.

Using one gun only, and starting with the gun empty and breech closed, just as it would be after having fired a shot, the ammunition being supplied under strictly service conditions, three rounds were fired at a target at a distance of 1,800 yards in 143 seconds. This gives an average of 48 seconds per round, and excellent as is the result it is only fair to add that it included delays amounting in the aggregate to no less than 46 seconds. These delays were due in the first place to the hydraulic rammers being locked, a circumstance which was not noticed until after the trials had commenced; and in the second place to the fact that the captain of the turret temporarily lost sight of the target owing to the approaching darkness (the hour of the trials was about 4.45 p.m., 20th January). If the lost period be eliminated it will be seen that the total time of loading and firing three rounds was only 97 seconds, or an average of 32·13 seconds per round. The first shot lifted the target out of the water. The second was from 10 to 20 yards over, the third 10 to the left and 20 over. The target was composed of three small buoys with red flags on the staves. Hitherto, one aimed round per minute has been considered as an excellent result from a 12-inch gun.

The success of the "Mikasa's" trials was largely due to the easy working of the breech screws. Never in all the twelve rounds fired did they even become stiff to work. The same man alone opened and closed them by hand throughout the trials. These were fitted with the Elswick mechanism. The aiming was much facilitated by a new single lever mechanism which combines the motions of training, elevating, and firing. Rapidity in loading was also gained by the use of a new arrangement for washing out the chamber and bore of the gun. The whole working of the guns and turrets was free from difficulties of any kind, and as the crew of the Elswick men and officers had only been got together and exercised in this particular ship, it is but fair to suppose that a more thoroughly drilled crew would have got even better results. The Japanese officers declare themselves most pleased, and heartily congratulated the Elswick firm on their success.—*Details supplied by Messrs. Vickers, Sons & Maxim.*

Trials of Japanese Destroyers.—The torpedo-boat destroyer "Shirakumo" (White Cloud), which is the first of two vessels now being completed by Messrs. John I. Thornycroft & Co., Ltd., for the Imperial Japanese Government, has completed her full-speed trial successfully in very boisterous weather at the mouth of the Thames. In spite of the unfavourable conditions, the mean speed maintained during the three hours' trial was 31·030 knots.

The results of six runs over the measured mile at the Maplin Sands were as follows, the conditions as to loading, etc., being very similar to those for British Admiralty vessels of this class:—

Run.	Time.	Speed.	Mean Revolutions.	Steam Pressure.
	m. sec.	Knots.	Per. min.	Lbs. per sq. in.
1	1 50·8	32·491	394·0	222
2	1 58·6	30·354	394·9	227
3[1]	1 48·4	33·210	407·4	230
4[1]	1 56·8	30·822	398·5	235
5	1 49·0	33·027	406·5	235
6	1 58·6	30·354	390·5	235

True mean speed ... ... 31,819 knots.
True mean revolutions ... ... 400·8 per min.

The vessel proved a good sea-boat and noticeably free from vibration.

The Japanese Government was represented by Captain Yamada and Lieutenant Shibaoka, I.J.N., the builders by Mr. Callaway (General Manager) and Mr. Donaldson. The "Shirakumo" and her sister-vessel the "Asashio" are 216 feet in length, about 21 feet beam, and have a maximum draught of about 8 feet 6 inches. They carry the armament usual in vessels of this class.

The "Asashio" will be launched at Chiswick in a few days, and will at once proceed on her trials. The Japanese torpedo-boat destroyer "Kasumi," launched from the Yarrow Yard, has completed her preliminary trial, when a speed of 31 knots was obtained with the contract load of 40 tons. A considerable number of destroyers of a similar design are now being constructed in St. Petersburg and South Russian shipyards for the Russian Government.—*Times.*

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[1] It will be seen that the mean of runs 3 and 4 is over 32 knots, so that the 'Shirakumo" is one of the fastest vessels in existence.

RUSSIA.—The following are the principal promotions and appointments which have been made: To be Admirals—Vice-Admirals Kaznakov, Member of the Admiralty Council; Tyrtov, Acting Minister of Marine. To be Vice-Admirals—Rear-Admirals Sidensner, and to be Senior Flag-Officer of the 2nd Seamen's Division; Reünov, Assistant to the Chief of the Naval Staff; Biriliev. To be Rear-Admirals—Captain Iretskoi, of the battle-ship "Borodino"; Nebogatov of the cruiser "Minin," and Second-in-Command of the Baltic Gunnery Training Squadron; Enkvist of the 9th Seamen's Division; Baron Stakelberg, commanding the Imperial Yacht "Standart." Vice-Admiral Messer to be a Member of the Naval Tribunal. Captains—Von Niedermüller, from the first-class cruiser "Pamiat Azova," to the 18th Seamen's Division, and the battle-ship "Borodino"; Miklukh, from the "Ne Tron Menia," to the coast-defence ship "Pervenets"; Zatsarenny, sen., to 19th Seamen's Division, and the battle-ship "Pobieda"; Von Niedermüller, jun., to the Caspian Seamen's Division; Dobrovolski, sen., to command the coast-defence ship "Ne Tron Menia"; Silman, sen., to command the 12th Seamen's Division and the cruiser "Pamiat Azova"; Tikhmeniev, from the "Berezan," to 26th Seamen's Division and the battle-ship "Kniaz Potemkin Tavricheski"; Ball, jun., from the same to the 33rd Seamen's Division and battle-ship "Chesma"; Golinov, sen., Second-in-Command in the Black Sea Training Squadron, to the training-ship "Berezan."

The following ships have been commissioned this month in accordance with the Admiralty programme for the usual evolutionary and instructional duties:—

IN THE BALTIC.

Gunnery School Division.

Second-class battle-ship—"Imperator Alexander II."
Coast-defence battle-ships—"General-Admiral Apraxin," "Admiral Ushakov," "Admiral Grieg," "Admiral Lazarev," "Pervenets," "Kreml."
Second-class armoured cruisers—"Pamiat Azova," "Minin."
First-class gun-boat—"Grosa."
Torpedo-cruiser—"Voïevoda," and four torpedo-boats.

Torpedo School Division.

School-ships—"Europa," "Dvina."
Third-class cruiser—"Africa."
Torpedo-cruiser—"Lieutenant Ilyin."
Destroyers—"Sokol," "Gagara," "Vzryv."
First-class gun-boat—"Dojd," and ten first and second-class torpedo-boats.

For Torpedo Experimental Duties.

Gun-boat—"Mina," and a small torpedo-boat.

Cadet School Division.

Second-class armoured cruisers—"General Admiral," "Kniaz Proyarski."
Third-class cruisers—"Rynda," "Viestnik."
School-ships—"Voin," "Vyerni," "Moryak."

For Engineer Cadets.

First-class armoured gun-boat—"Grosiashchi."
School-ship—"Stryelok," with one large and three small torpedo-boats.

For Training Stokers.

Coast-defence battle-ships—"Ne Tron Menia," "Admiral Chichagoff."

Torpedo-cruiser—"Posadnik."

Destroyers—"Yastreb," "Korshun," "Sova," with twenty torpedo-boats and several small vessels for diving instruction, surveying, etc.

To be Commissioned for Trials.

First-class battle-ships—"Imperator Alexander III.," "Osliabia."

Second-class cruiser—"Avrora."

IN THE BLACK SEA.

Evolutionary Squadron.

First-class battle-ship—"Kniaz Potemkin Tavricheski."

Second-class battle-ships—"Rostilav," "Ekaterina II.," "Dvyenadsat Apostoloff," "Georgi Pobiedonossets."

Torpedo-cruisers—"Kapitan Sacken," "Griden," "Kasarski."

Mining-vessel—"Dunai."

Destroyers—"Lebedev," "Pelikan," with five small torpedo-boats.

Training-ship for Petty Officers.

Third-class cruiser—"Pamiat Merkuria."

Black Sea Training Division (for principal Gun-numbers, Electric and Torpedo-Personnel).

Second-class battle-ship—"Chesma."

School-ship—"Berezan."

First-class gun-boat—"Saporoshets."

Mining-vessel—"Bug," with three torpedo-boats and some smaller vessels for training stokers, etc.

To be commissioned for service abroad:—

FOR THE CHINA STATION.

In May, the third-class cruiser "Novik."

In June, the first-class battle-ship "Retvizan."

In July, the second-class cruisers "Askold" and "Bogatyr."

In August, the armoured cruiser "Bayan," the second-class cruiser "Diana," and the third-class cruiser "Boyarin."

In the autumn, if possible, the first-class battle-ship "Pobieda" and the second-class cruiser "Pallada."

In addition, the destroyers "Forel," "Sterliad," and "Osetr," built at Havre, left that port in the middle of February for China, and will be followed to the same station in due course by the other five destroyers still under construction in French yards.

In the Mediterranean Squadron there is to be no change.

Training-ships in the Atlantic.

Second-class armoured cruiser—"Herzog Edinburgski."

Second-class cruiser—"Kreiser."

The destroyers "Pavlin," "Fasan," "Lebedev," and "Pelikan," at present attached to the Baltic Fleet, are, in the course of the year, to be transferred to the Black Sea for service with the squadron there; they are the first destroyers to be attached to the Black Sea Fleet.

The experiments with captive balloons in the Black Sea have been so satisfactory that this year the ships of the Training Division are to be supplied with them. A detachment of officers, petty officers, and men have been sent for a course of instruction in their management to the Army Ballooning School.

The newly-formed 37th Seamen's Division for the Black Sea Fleet has received the St. George's Standard of the old 37th Division; the men wear the George cap ribbon.

A Commission is sitting to enquire into the question of a reform in the Naval Construction and Engineering Corps. It is believed that the officers of both categories will receive military rank corresponding to officers of the military branch.

Dockyard Notes.—The repairs to the battle-ship "Ekaterina II.," which have been carried out at Nicolaieff, and have included the substitution of Belleville boilers for her old cylindrical ones, are now almost completed. Her sister ship the "Chesma" will next be taken in hand, and will receive triple-expansion engines and water-tube boilers, by which change it is hoped that her speed will be materially increased. The gun-boat "Chernomorets" is also to be new boilered: her repairs were to have been taken in hand last year, but her services were required as "stationaire" at Constantinople.

We learn from Nicolaiev that a trial has taken place of the engines of the battle-ship "Kniaz Potemkin Tavricheski," of 10,600-H.P. The results were successful; these engines were turned out by the Nicolaiev Works, and are the first of the kind produced in the south of Russia.

The coast-defence ironclad "Admiral Seniavin" will not, in all probability, be ready for commission by the opening of the cruising season, but her repairs are being pushed on with a view to her being in readiness by the beginning of May.

It is announced from the Vulcan Works at Stettin that the preliminary trial of the second-class cruiser "Bogatyr," of 6,500 tons, held in December, in the presence of Russian officers, gave most excellent results. At full draught the engines developed 20,500-I.H.P., the speed attained exceeding 24 knots. She was taken back to the yard for completion, and the official trial of her will be held shortly.

The work of reconstructing the battle-ship "Piotr Velikie" is in hand. Constructors will be employed of the same qualifications as if it was her first building. This is the first occasion on which such a rule has been enforced.

During the past year the Russian Navy has been strengthened by the launch of the following ships:—

Battle-ships—"Cesarevich" (Toulon). "Imperator Alexander III." (from the Baltic Works).

Second-class cruiser—"Bogatyr" (Vulcan Yard at Stettin).

Third-class cruiser—"Boyarine" (Copenhagen).

Destroyers—"Osetr," "Kefal," "Losos," "Forel," "Sterliad," these latter being all built at Havre, the first three at the Forges et Chantiers, and the last two at the Normand Yard.

The following, already launched, are still in process of construction, or have been completed:—

Battle-ships—"Orel" (St. Petersburg), "Retvizan" (Philadelphia), "Kniaz Suvoro" (St. Petersburg).

Coast-defence ironclad—"Admiral Butakov" (St. Petersburg).

First-class armoured cruiser—"Bayan" (Toulon).

Second-class cruiser—"Askold" (Kiel).

Third-class cruiser—"Novik" (Danzig).

Torpedo-boats—Several.

The following are building :—

Battle-ship—"Slava."

Second-class cruisers—"Kagul," "Ochakov," "Oleg."

Third-class cruisers—"Jemchug," "Izumorud," "Almaz."

Training-ship for Engineers—"Okean."

Torpedo-boats of various types.

The new ships whose trials have been completed are :—

First-class battle-ships—"Osliabia," "Pobieda."

First-class cruisers—"Diana," "Avrora," "Pallada."

All these will be commissioned for cruising this year. To these must be added the following, which were sent abroad for the first time last year :—

First-class battle-ship—"Peresviet."

Second-class cruiser—"Variag."

Torpedo-transports—"Amur," "Yenisei."

The battle-ship "Imperator Alexander II." was withdrawn from the Mediterranean Squadron and replaced by the "Imperator Nicolai I."

General.—The manœuvres held in the autumn included the convoying of a considerable body of troops from Revel, carried partly in hired transports, partly in the vessels of the Gunnery Squadron, the cruisers "Minin" and "Pamiat Azova," and the coast-defence ships "Admiral Seniavin," "Admiral Lazurev," "Admiral Grieg," and "Admiral Ushakov" forming the nucleus of the squadron. An advance guard of the cruiser "Voïevoda" and several torpedo-boats prevented any molestation from the torpedo-boats of the opposing squadron, and under the fire of their own ships the troops were successfully landed at Biorké. Subsequently most of the vessels bombarded the fortifications of Kronstadt. Landing parties detached by the ships proved a valuable adjunct.

During the manœuvres carried out in October by the Pacific Squadron an attack was made on Port Arthur, which it was proposed to bombard and blockade; the defending squadron made a night attack on the assailants. It being a moonlight night, there was very little chance of any real practice being obtained. The usual review closed the operations.

In the course of a lecture at the Nicolaiev Engineer Academy by Commander Beklemishev on "The Navies of the Present Day," as regards the question of armour it was laid down that protection should extend over an area of the ship estimated on the probability of actual hits at medium distances, say 15 cables lengths. Large ships required comparatively less powerful engines to attain the same rate of speed, hence they could be more heavily armoured and carry heavier guns. There was talk of carrying ships to a displacement of 30,000, but he doubted whether such a huge warlike unit could be properly managed, and the draught would be prohibitive in many harbours and channels. As regards the respective values of guns afloat and ashore, he thought three of the former equal to one in a land battery, provided the latter were quick-firing, and had a due proportion of howitzers. This was counting only ship's guns of at least 3 inches calibre. For instance, the "Magnificent" or "Kaiser Frederich III." had 19 such guns, and would therefore be roughly on an equality with a 6-gun shore battery. As 3 ironclads under steam would cover two-thirds of a mile of fighting position, a corresponding front of fortification on shore should have 18 guns. Another authority had laid it down that 15 were sufficient.

A regular course in paymaster's work has been opened, to which officers of all branches are admitted. It is to last two years, and besides theoretical instruction,

includes a practical insight into stores and provisions at the places where they are produced. Those who have left the Cadet College are admitted *ipso facto*. Others have to pass an entrance examination. The wisdom of the step is considered somewhat doubtful in naval circles, as such matters are more likely to be well managed by experts; and combatant officers, especially captains, have their hands sufficiently full. At present such matters are largely left to them. The revival of the old "Revizors" or pursers is considered by many preferable to the plan now set going.

The Far East.—The authorities are beginning to realise some weak points in their naval position in the Far East. The bases, Port Arthur and Vladivostok, are very far apart, and are, moreover, divided by a serious obstacle in the shape of the Strait of Corea and the fortified port of Tsu-Sima. The former is so narrow that in clear weather you can see from the Corean shore the cliffs of the latter. An enemy would force their ships to operate in two portions for the defence of the coasts and the prevention of blockade and bombardment. And it would for the same reasons be difficult to concentrate them again for a decisive blow at sea. Large numbers of swift sea-going torpedo-boats might to some extent suffice for the protection of the ports, but their smoke would betray them, and a good look-out on the part of the enemy would make night attacks very risky. Submarines might to some extent be an advantage to the defence. These should be stationed at Vladivostok, the Bay of America and Posiet Gulf on the one side, and Port Arthur on the other. They would, however, have to be fairly numerous to allow for detaching some. There would hardly be a landing attempted in the Gulf of de Castri, on the embouchure of the Amur, as the enemy would be exposed to attack from the Ussuri District. Thus the Gulf of Peter the Great and the Bay of St. Olga are the only points where an attempt at a landing has much likelihood of being made. The latter could, if necessary, be safely left to submarines to defend. A movable station for them could be constructed, which in two or three days could be transferred to the point where they were needed, and the same would apply to Port Arthur and Dalny, thus setting the ordinary fleet at liberty to operate at sea. Their sphere of action being necessarily limited, they would have to be freely supplemented by torpedo-boats as scouts and look-outs at suitable points. Pigeon-post would also be valuable for the carrying of information.—*Kronstädtski Viéstnik.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR MARCH, 1902.

Lieut.-General J. F. Owen, R.A., to be President of the Ordnance Committee. Lieut.-Colonel W. J. B. Bird, I.S.C., to be Colonel. Lieut.-Colonel W. E. G. Forbes, C.B., h.p., to be Colonel. Colonel H. E. Belfield, C.B., now an A.A.G., is granted the local rank of Brigadier-General whilst acting as Inspector-General of Imperial Yeomanry in South Africa. Major-General Sir J. D. P. French, K.C.B., to be Colonel of the 19th (Princess of Wales's Own) Hussars. Lieut.-Colonel H. C. Harford, h.p., to be Colonel. Lieut.-Colonel F. G. Vivian, I.S.C., to be Colonel. Lieut.-Colonel R. C. Hadow, D.S.O., I.S.C., to be Colonel. Lieut.-Colonel R. Fulton, I.S.C., to be Colonel. Lieut.-Colonel F. R. Lowth, C.B., h.p., to be Colonel. Lieut.-Colonel and Brevet Colonel N. M. Lake, from an Assistant Inspector-General of Fortifications at Head-Quarters to be a Deputy Inspector-General of Fortifications at Head-Quarters. Lieut.-Colonel H. M. Carter, C.B., h.p., to be Colonel. Colonel B. Franklin, K.H.P., C.I.E., I.M.S., to be Surgeon-General.

INDIA.—The total strength of the Indian contingent which proceeds to England to take part in the ceremonials connected with the Coronation of the King-Emperor will be 1,000 of all ranks, viz., 250 cavalry, 750 infantry, artillery, and sappers. The total of 1,000 will include 100 Imperial Service troops. The Native cavalry will be represented by 14 detachments, 11 consisting of 1 Native officer, 19 rank and file, and 3 of 1 Native officer and 8 rank and file. The Native infantry will be represented by 20 detachments, each consisting of 1 Native officer, 26 rank and file: the Native artillery by a detachment consisting of 2 Native officers and 54 non-commissioned officers and men, to be selected by the Inspector-General of Artillery from the Native mountain batteries; the Indian sappers and miners by 3 detachments, each consisting of 1 Native officer and 16 rank and file. The Imperial Service troops to be represented will be selected from the troops of the different States under the orders of the Inspector-General of Imperial Service Troops.

The following races will be represented in the contingent:—Sikhs, Dogras, Pathans, Afridis, Punjabi Mahomedans, Madras Mahomedans, Rajputs, Jats, Hindustani Mahomedans, Mahrattas (Deccani), Mahrattas (Konkani), Deccani Mahomedans, Brahmans, Gurkhas, Garhwalis, Tamils, Moplahs, Mers, Hazaras, Baluchis, and Multani Pathans. The above will be selected from troops of each command in the following proportion:—

Cavalry:—Punjab—5 detachments, viz., 1 of Sikhs, 1 of Dogras, 1 of Punjabi Mahomedans, 1 of Multani Pathans, 1 of Pathans. Bengal — 2 detachments, viz., 1 of Jats and 1 of Hindustani Mahomedans. Bombay—2 detachments, viz., 1 of Rajputs and 1 of Mahrattas. Madras—1 detachment of Madras Mahomedans. Hyderabad—1 detachment of Deccani Mahomedans. The Viceroy's Bodyguard—1

representative of the classes enlisted therein. The bodyguards of the Governors of Madras and Bombay, each 1 detachment of the classes enlisted therein.

Infantry:—Punjab—5 detachments, viz., 1 of Sikhs, 1 of Dogras, 1 of Punjabi Mahomedans, 1 of Afridis, 1 of Pathans. Bengal—6 detachments, viz., 1 of Brahmans, 1 of Rajputs, 1 of Jats, 1 of Hindustani Mahomedans, 1 of Gurkhas, 1 of Garhwalis. Madras—3 detachments, viz., 1 of Tamils, 1 of Moplahs, 1 of Madras Mahomedans. Bombay—5 detachments, viz., 1 of Deccani Mahrattas, 1 of Konkani Manrattas, 1 of Mers, 1 of Hazaras, 1 of Baluchis. Hyderabad—1 detachment of Deccani Mahomedans.

Artillery:—1 detachment of mountain artillery, 56 of all ranks.

Sappers:—1 detachment.

The Bengal, Madras, and Bombay Regiments selected to furnish the detachments of the several classes are as follows:—

Cavalry:—Punjab—Sikhs, 10th Bengal Lancers; Dogras, 11th Bengal Lancers; Pathans, Guides; Multani Pathans, 15th Bengal Lancers; Punjabi Mahomedans, 18th Bengal Lancers: Bengal—Jats, 14th Bengal Lancers; Hindustani Mahomedans, 1st Bengal Lancers. Bombay—Mahrattas, 1st Bombay Lancers; Rajputs, 3rd Bombay Cavalry. Madras—Madras Mahomedans, 1st Madras Lancers. Hyderabad—Deccani Mahomedans, 1st Lancers, Hyderabad contingent. The Viceroy's bodyguard and the bodyguards of the Governors of Madras and Bombay, representatives of the classes enlisted therein. Sappers and miners, representatives of the classes enlisted.

Infantry:—Punjab—Dogras, 38th Dogras; Sikhs, 15th Sikhs; Punjabi Mahomedans, 33rd Punjab Infantry; Pathans (not Afridis), 20th Punjab Infantry; Afridis, 1st Punjab Infantry. Bengal—Brahmans, 1st Brahmans; Jats, 10th Jats; Hindustani Mahomedans, 17th Bengal Infantry; Rajputs, 7th Rajputs; Gurkhas, 2nd Gurkhas; Garhwalis, 39th Garhwa Rifles. Madras—Tamils, 1st Madras Infantry; Moplahs, 2nd Battalion Moplah Rifles; Madras Mahomedans, 20th Madras Infantry. Bombay—Mahrattas (Deccani), 1st Bombay Grenadiers; Mers, Merwara Battalion; Hazaras, 24th Baluchistan Regiment; Baluchis, 29th Baluchis; Konkani Mahrattas, 3rd Bombay Light Infantry. Hyderabad—Deccani Mahomedans, 1st Infantry, Hyderabad contingent.

A stationary Native hospital of fifty beds will accompany the contingent. No followers will be allowed except one servant for each British officer. Native officers will be allowed to employ sowar or sepoy batmen. The contingent will be equipped with tents for all ranks. Officers and men will be considered on furlough during their absence from India. Free passages by rail and sea will be granted. British officers will be granted a deputation allowance of £1 per diem; Native officers free rations on board ship and in England full pay and allowances with an extra allowance of 10s. per diem, also free foreign service kit. Non-commissioned officers and men will receive similar concessions, but will be given 5s. and 2s. per diem respectively. The deputation allowances will be admissible only during the period of the stay of the contingent in England. All details will take with them their complete uniforms, arms, accoutrements, and saddlery. Officers and mounted troops will be provided with horses in England. Guns and mules for the detachment of mountain artillery will also be provided in England if necessary. Two military staff clerks will be detailed from Army or command headquarters for duty in the staff offices of the contingent. They will receive full pay and allowances, plus an addition of 50 per cent. on their total emoluments. The officers and all ranks of the contingent must be medically examined before starting. They will be granted an advance of three months' pay before leaving their regiments.—*Pioneer Mail.*

SOUTH AFRICA.—The frontispiece in this month's JOURNAL shows the town of Colesberg, Cape Colony, with Coleskop in the background. The operations conducted by Lieut.-General Sir J. D. P. French, K.C.B., round Colesberg, which was occupied by the Boers and proclaimed Free State territory on the 17th November, 1899, are amongst the most important of the war. A noticeable event in connection therewith was the successful effort of hauling two 15-pounder guns of the 4th Battery, R.F.A., to the top of Coleskop, a high hill opposite the western face of the Boer position. The operation was carried out with great perseverance and energy under the superintendence of Major A. E. A. Butcher, D.S.O., commanding the battery, and taxed the efforts of some 200 men for eight hours. The hill is 800 feet above the level of the plain, and its sides are very steep, in places almost perpendicular. The ammunition was taken up by means of a wire lift constructed and designed by the Royal Engineers. From their commanding position the guns performed signal service and inflicted great damage and severe loss on the Boers. The fire of the guns dominated the whole of the enemy's position, causing the Boers to clear away all their tents and laagers on open ground, and to take shelter in rocky valleys, which occasioned them great inconvenience and serious loss. Coleskop was a most desirable signal-station, and after the evacuation of the town of Colesberg by the Boers on the 27th February, 1900, and its occupation by Major-General R. A. P. Clements, D.S.O., A.D.C., the hill was utilised as, and still serves the purpose of, a signal station. The frontispiece is from a photograph supplied by Lieut.-Colonel R. M. Holden, Secretary, Royal United Service Institution, and recently Commandant of the District of Colesberg.

FRANCE.—The nature and the duration of the Autumn Manœuvres for 1902 have been decided upon as follows:—

1. *Army Manœuvres.*—These will be carried out under the chief supervision of General Brugère, Vice-President of the Conseil Supérieur de la Guerre. The XVIth and XVIIth Army Corps, 2 cavalry brigades, to be hereafter selected, and a colonial infantry brigade will take part in them.

2. *Division and Brigade Manœuvres.*—Division manœuvres will be carried out, 1st by the XIth and XVIIIth Army Corps, and will be regulated by special instructions; 2nd by the IIIrd, IVth, Vth, VIIth, VIIIth, IXth, Xth, XIIth, XIIIth, and XXth Army Corps and by the 40th Division of the VIth Army Corps. These manœuvres, including marches for concentration and for return to quarters, will last 14 days, with the exception of those of the 39th Division of the XXth Army Corps, which will only extend over 11 days. Brigade manœuvres will be executed by the Ist and IInd Army Corps, and by the 12th and 42nd Divisions of the VIth Army Corps. These manœuvres, including marches for concentration and for return to quarters, will last 12 days. Division and brigade manœuvres will be carried out in the XIVth and XVth Army Corps, and will form the subject of special instructions.

3. *Cavalry Manœuvres.*—Combined cavalry manœuvres will be carried out under the direction of General Donop, commanding the Xth Army Corps, President of the Comité Technique de Cavalerie. The following will take part in these manœuvres, viz.:—The 1st Cavalry Division, the 5th, 9th, and 12th Cavalry Brigades, the 1st Cuirassier Brigade of the 3rd Cavalry Division, the 13th Cuirassier Regiment of the 7th Cavalry Division, and a brigade division of horse artillery, which will be selected later These manœuvres will last for 20 days, including marching for concentration and for return to quarters. Brigade evolutions will be carried out by those

cavalry brigades which did not take part in the Eastern or Western Army Corps Manœuvres, or in Cavalry Division Manœuvres in 1901, or which have not been selected to take part in the Army Corps or Combined Cavalry Manœuvres this year. These evolutions will last for 14 days, including marches for concentration and for return to quarters.

4. *Fortress Manœuvres* will be carried out at the Camp at Châlons.

5. *Various Manœuvres.*—Independent of those manœuvres already mentioned, special manœuvres will be carried out in the Alps, the Vosges, as well as in Algeria and Tunis, which will form the subject of future instructions.

General Dispositions.

Under reserve of special instructions, which may be issued by the Minister of War, the Army, Division, and Brigade Manœuvres will be organised and regulated in conformity with the regulations of the General Instructions for Manœuvres of the 18th February, 1895. Any alteration in the nature of the manœuvres laid down, and all efforts to bring into the field larger effectives than those of the units taking part in them, is strictly forbidden. The 7th Division of the IVth Army Corps will carry out their manœuvres during the month of August; the Special Military School will take part in them.

Special Dispositions for Various Branches of the Service.

Infantry.—Infantry regiments will march to manœuvres with their four battalions, with the exception of those regiments in which no company of the 4th Battalion has yet been regularly formed. The 4th Battalions of regiments belonging to the Xth and XIIth Army Corps, stationed in Paris, those of regiments of the VIth, VIIth, and XXth Army Corps, which garrison fortified places and the frontier forts, will not take part in the manœuvres. The 145th Regiment will manœuvre with the 2nd Division of the Ist Army Corps. Battalions of Chasseurs à Pied will participate in the manœuvres of their respective army corps. The 20th Battalion will take part in the manœuvres of the 10th Infantry Division of the Vth Army Corps. Battalions of Zouaves quartered in Paris will also manœuvre with that division.

Cavalry.—Brigades of corps cavalry should, with certain exceptions ordered by the Minister of War, take part in the Division and Brigade Manœuvres of their Army Corps. In the VIth and VIIth Army Corps the cavalry necessary for the manœuvres of the 3rd Divisions of these army corps will be furnished by one of the regiments of a cavalry division quartered in the district.

Artillery.—Brigade divisions will consist of three batteries. They may be reduced to two batteries in corps called upon to furnish artillery units to army corps taking part in the Army Manœuvres. In order to facilitate participation in the manœuvres by units of corps artillery regiments, the divisional artillery will include, as a rule, a brigade division furnished by the corps regiment.

Staff Rides and Manœuvres with Cadres.

An Army Corps Staff ride will be carried out in each army corps, including the colonial one, and in the Paris Military District. Special rides will replace army corps rides in the XIVth and XVth Corps districts, and will form the subject of later instructions.

Two manœuvres with line division cadres (three in both the VIth and VIIth Army Corps) and one manœuvre with reserve division cadres will be carried out in all army corps, with the exception of the colonial one. In addition, a manœuvre with

fortress cadres will take place in the XIVth Army Corps, and the Lyons district brigade will carry out a manœuvre with brigade cadres. In the Colonial Army Corps two manœuvres, with line division cadres, will be organised. Generals commanding army corps who intend to organise an army corps cadre manœuvre will notify the fact before the 15th March.

Four brigade cadres manœuvres will be carried out in the XIXth Army Corps, and two brigade cadres manœuvres will be executed in the Tunis Occupation Division. Cavalry divisions and cavalry permanent inspection districts will each carry out a division cadres manœuvre.—*Revue du Cercle Militaire.*

According to a recent circular of the French Minister of War, volunteers for the French Colonial Army who are only 18 years of age must engage for five years' service; if 19, for four or five years of service; and if 20, for three, four, or five years' service. Men of less than 20 years of age who are tailors, harnessmakers, shoemakers, farriers, musicians, or any other trade or calling required in the Army, may be accepted as volunteers for three years' service. Another circular states that foreigners volunteering for the French Foreign Legion must be between the ages of 18 and 40; must be physically fit to bear the fatigue of campaigning in Algeria or elsewhere in the French colonies; must not be less than 5 feet in height; and must bear a good character. Frenchmen who belong to the Army Reserve or to the Territorial Army may also join the legion, in which they must engage to serve for five years.

The *France Militaire* states that 14 of a new gun to be used in the defences on the French coasts have arrived at the artillery range at St. Chamond, where they are being tested. The gun is a 9·45-inch one, and throws a shell weighing 377 lbs. It can fire 20 rounds or a weight of over three and a third tons of metal in less than seven minutes, and this rate of firing can be maintained until the heat of the gun prevents it, each shot being well aimed. The muzzle velocity of the shell is 1,148 feet per second; the carriage is equal to a strain of more than double that velocity.—*Times.*

GERMANY.—A Cabinet Order of the 6th February last lays down that the Imperial Manœuvres for this year will be carried out by the IIIrd Army Corps (Berlin) under the command of General von Lignitz, and by the Vth Army Corps (Posen) under the command of General von Stülpnagel. These two army corps are to be made up to a strength of 3 divisions each, and for this purpose the IIIrd Army Corps which only consists of 2 divisions with 4 brigades will be reinforced by the 1st Guards Infantry Division, to which the Guards Hussar Regiment will be attached as divisional cavalry, and by a company of the Guards Pioneer Battalion. The Vth Army Corps, which consists of 2 divisions with 5 brigades, will be reinforced by the 8th Infantry Brigade (IVth Army Corps), the 3rd Dragoon Regiment (Horse Grenadiers—IInd Army Corps), and by the Instruction Regiment of the Field Artillery School of Gunnery. Supply Columns will be formed for each of these two army corps, and with this object recourse will be had to the transport battalions of the following army corps, viz.: The Guards, the Ist, IInd, IVth, VIth, Xth, XIth, and XVIIth. Each army corps will have its own balloon section. The *Ordre de Bataille* for the manœuvres will be prepared later by the Chief of the General Staff and submitted to the Emperor for his approval. The operations will take place in the district between the Oder and the Lower Obra.

To the IIIrd, Vth, and also to the XVIth Army Corps, 3 cavalry divisions (A, B, and C) will be attached, which will be organised as follows:—

Cavalry Division A, attached to IIIrd Army Corps: 1st Guards Cavalry Brigade (Gardes du Corps Regiment and Guards Cuirassier Regiment): 2nd Guards Cavalry Brigade (1st and 3rd Guards Uhlan Regiments); 6th Cavalry Brigade (3rd and 6th Hussar Regiments); 3rd Brigade Division of Horse Artillery: and a detachment of Guards Pioneers.

Cavalry Division B, attached to Vth Army Corps: Brigade of Guards Hussars (1st and 2nd Regiments): 9th Cavalry Brigade (4th Dragoons and 10th Uhlans); 12th Cavalry Brigade (6th Hussars and 2nd Uhlans); 35th Brigade Division of Horse Artillery: and a pioneer detachment from the VIth Army Corps.

Cavalry Division C attached to XVIth Army Corps: 31st Cavalry Brigade (15th Dragoons and 9th Hussars): 33rd Cavalry Brigade (9th and 13th Dragoons); 34th Cavalry Brigade (6th Dragoons and 14th Uhlans); and the 8th Brigade Division of Horse Artillery.

The Emperor reserves to himself the nomination of the division commanders.

The cavalry divisions will carry out special manœuvres, A and B at Alten-Grabow and at Posen respectively, and C Division in the district of the XVIth Army Corps. As an exceptional measure, the cavalry of the B Division will not take part in the division and brigade manœuvres of the Vth Army Corps. The Emperor will specially inspect the cavalry divisions.

Commanders of army corps may, with the authority of the War Minister, cause brigade manœuvres with 4 battalions to be carried out should they consider it desirable.

Attack manœuvres under service conditions on fortified positions will be carried out in the Ist, IXth, and XVIII Army Corps, in which heavy field artillery will take part.

Cavalry rides, in accordance with the instructions of 23rd January, 1879, will take place in the Guards Corps, and by the cavalry belonging to the IVth, VIIth, IXth, Xth, XVth, XVIIth, and XVIIIth Army Corps. Finally, Grand Manœuvres for Pioneers will take place on the Upper Rhine near Rastatt and between the Elbe and the Havel. Instructions regarding them will be issued by the Inspector-General of Pioneers. Troops must have returned to their quarters by the 30th September.—*Précis from Militär-Zeitung.*

Ueberall states that in the autumn manœuvres of the German Army this year there will be for the first time commissariat columns accompanying the troops. On former occasions reliance was placed on the hire of farmers' wagons, but with the growth of the Army this means is found to be insufficient. Each commissariat column consists of twenty-seven four-horse or thirty-six two-horse wagons, each carrying a load of from 1½ to 2 tons. Unlike the farmers' wagons, with their cumbersome structure, are compelled to follow the main roads, the military wagons are able to follow the troops over any track. A necessary adjunct to the commissariat columns is the establishment of provision magazines, from which the columns can draw their supplies. The practice of billeting the troops at the manœuvres and of obtaining supplies from camp-followers will not be discontinued, but the commissariat columns in conjunction with the magazines will be prepared to take the full responsibility of feeding the troops even when all other sources fail. Experiments have been recently made in the neighbourhood of Magdeburg with Fowler's road engines and trucks. At the manœuvres last year these were used chiefly on the main roads, where they gave every satisfaction; the recent tests were made on soft ground. The loaded trucks each weighed from 12½ to 17½ tons, but they were successfully drawn over the soft ground, even when both locomotive and

trucks sank deep into the mud. Experiments were also made in dragging the trucks by means of a wire cable attached to the engine, the distance between the engine and the trucks being, to begin with, a third of a mile. The locomotives were afterwards used to move targets weighing about 12½ tons which had been previously moved by horses. All the work was performed satisfactorily.

The same journal says that the new organisation of the Bavarian Artillery, according to the Bill of 25th March, 1899, has now been completed. The Bavarian Army has three army corps, with headquarters at Munich, Wurzburg, and Nuremburg. To them belong 6 field artillery brigades of 2 regiments each. A regiment consists of 5 batteries, with the exception of the 5th Regiment, which has two horse artillery batteries in addition. Every army corps has also 2 batteries of light field howitzers. There are in the Army 2 regiments and 2 separate battalions of foot artillery, 3 pioneer battalions, 1 railway battalion, and a balloon section. According to the Army List of Saxony for 1902, there are in the Saxon Army 28 generals, 225 colonels, 400 captains, 330 first lieutenants, 511 other lieutenants, 77 ensigns, and 131 medical officers. In the Reserve there are 85 captains, 240 first lieutenents, 870 other lieutenants, and 515 medical officers. In the Landwehr there are 810 combatant and 200 medical officers. The 2 army corps, of which the Saxon Army consists, count 15 regiments of infantry, 2 rifle battalions, 6 cavalry regiments, 8 regiments of field artillery, 1 regiment of foot artillery, 2 pioneer battalions, 2 railway companies, 1 detachment with the Prussian experimental railway section, 1 telegraph company, and 2 army service battalions.—*Times.*

The *Internationale Revue über die Gesammten Armeen und Flotten* has recently published the following recruiting report for the Military and Naval Forces of Germany for 1900 :—

The following were borne on the Alphabetical and on the Residue Lists, viz. : 695,757 youths aged 20 ; 488,772 aged 21 ; 361,649 aged 22 ; 99,668 aged from 23 to 45 years ; making a total of 1,645,846 *Gestellungspflichtigen*, that is to say, men who are liable to service and who are obliged to appear before the recruiting boards. Out of the above total, 1,159,372 men who were not definitely put back, were thus distributed : 62,295, aged from 23 to 45, could not be found ; 97,819, aged 20, 21, and 22 years, failed to appear ; 425,489, in consequence of a change of domicile, were obliged to present themselves before recruiting boards, other than those for which they were registered ; 573,799, who had been put back either for family reasons, for study, for judicial instruction, or for passing bodily defects. The 486,474 men (1,645,846—1,159,372) were thus classified : 1,171 unfit for service on account of misconduct ; 39,345 dismissed as unfit for all service ; 102,723 attached to the 1st Levy of the Landsturm on account of constitutional physical weakness ; 80,986 recognised as likely to become fit for service later, and attached to the *Ersatz Reserve* ; 1,130 attached, for the same reason, to the Naval *Ersatz Reserve* ; 233,459 enrolled in the regular military and naval forces ; 1,276 fit for service but not enrolled, as being in excess ; 25,175 already enlisted as Volunteers in the Army ; thus reaching the total 486,474. It should be added that 21,197 youths enlisted in the Army, and 1,591 in the Navy, before reaching the age for being called to the colours.

The 233,459 youths enrolled in the regular military and naval forces were thus distributed : 222,667 were attached to a combatant and 4,608 to a non-combatant branch of the Army, and 6,184 to the Navy. The excess of men fit for service

resulting from the large number of youths enlisting before attaining the military age constitutes a reserve which may be always relied upon for the formations of weak fresh units, such as machine gun groups. In the youngest class 43,282 men, without any excuse, failed to appear; but, on the other hand, the same class furnished 49,122 volunteers. The volunteers for one year, whose number is annually from 10,000 to 12,000 are not included in the 49,122. By including these a total of, in round numbers, 60,000 volunteers is obtained, which is 20 per cent. of all the men called to the colours in the course of the year, a percentage which is not reached by any other Power where military service is obligatory. The percentage of naval volunteers is even higher, for not counting the one-year volunteers, 2,750 enlist voluntarily for 6,184 called out, which gives a percentage of 30·8.

As the effective of the contingents called to the colours each year has been frequently increased since 1878, one must, if one wishes to arrive at an exact estimate of the military and naval forces at present available, take an average for the annual contingent, which, for the period between 1878 and 1902, is 226,282 men, not including one-year volunteers. If 25 per cent. is deducted for losses, a total of 4,242,809 trained and well-disciplined soldiers is obtained from the 25 classes. In the event of war this number would be further increased by officers, doctors, and other functionaries on the retired list, as well as by non-commissioned officers of over 25 years' service; these would, in round numbers, amount to 50,000. Taking further into consideration the men attached to the different *Ersatz Reserven* and to the 1st Levy of the Landsturm and deducting 50 per cent. for losses, a total of 1,904,275 Germans is obtained, of from 20 to 45 years, all compelled to serve in war-time, and partially trained, plus 471,271 youths of from 17 to 19 years also compelled to serve, and in addition also 287,537 men put back from the last operations of the recruiting boards. One thus obtains 2,663,083 men partly trained, and partly untrained, but all capable of being employed on war service.

The result of the census taken on the 1st December, 1900, strikingly proves that there are actually 7,000,000 men capable of being made use of in the event of war, and that it would be possible to place in line the effectives mentioned above. As a matter of fact, on the 1st December, 1900, there were in Germany: 9,585,803 men of from 17 to 45 years of age; 26,494 on board German ships navigating or anchored in foreign ports: 20,000 belonging to either the Expeditionary Corps in the Far East, or to various Colonial Corps, and about 500,000 Germans residing abroad and liable to military service. The zeal with which the German military authorities shadow each man liable to military service from the age at which that obligation commences until the moment he is completely free of the same is a certain guarantee that in the event of war every citizen who, through age, is liable to serve for the defence of his country, will actually respond to the call to arms.

ITALY.—The adoption of the new field artillery *matériel* will entail the reorganisation of that branch of the Service. At present the Italian artillery consists of: Four inspecting staffs; 1 committee for experiments; 8 artillery commands; 14 territorial sub-divisions; 24 field artillery regiments, consisting of 186 batteries divided into 48 brigade divisions, 36 transport companies and 24 depôts; 1 horse artillery regiment with 6 batteries, divided into 3 brigade divisions, plus one group of 4 transport companies and a depôt; 1 mountain artillery regiment with 15 batteries, divided into 5 brigade divisions and a depôt; 22 coast and fortress artillery brigades (11 of each), having in all 78 companies and 2 administration bureaux; 5 companies of artificers.

The present law regarding the cadre of officers fixes that of the artillery at 1,684, who are thus distributed by ranks: 42 colonels; 62 lieut.-colonels; 116 majors; 528 captains; 926 subaltern officers.

The characteristic of the new organisation, which is about to be submitted to Parliament, is the re-constitution of coast and fortress artillery regiments, which were done away with in 1895, and the conversion of the brigade divisions into field artillery. At the present time of the 48 brigade divisions, of which the field artillery regiments consist, 42 are made up of 4, whilst 6 have only 3 batteries. According to the new organisation, each field artillery regiment will consist of 3 brigade divisions (2 to 3 and 1 to 2 batteries). Later on the brigade divisions will be made up to 2 batteries each, by joining to them a howitzer battery, should the experiments now being carried out demonstrate the utility of these guns, on which opinion is still divided. It is not known if the ministerial scheme provides for the re-constitution of the 6 field batteries which were transformed in 1895.

The Italian new artillery organisation will be as follows: 1 general inspection staff; 3 inspection staffs; 9 artillery commands; 13 territorial sub-divisions; 24 field artillery regiments, forming 72 brigade divisions, 36 transport companies and 24 depôts; 1 horse artillery regiment with 3 brigade divisions (in all 6 batteries), 1 group of 4 transport companies and 1 depôt; 1 mountain artillery regiment with 5 brigade divisions (in all 15 batteries) and 1 depôt; 6 coast and fortress artillery regiments with 24 brigade divisions (in all 72 companies) and 6 depôts; 1 coast artillery brigade division of 3 companies for Sardinia; 6 companies of artificers.

The new artillery organisation demands a cadre consisting of 1,738 officers, thus made up, viz.: 45 colonels; 69 lieut.-colonels; 132 majors; 539 captains; and 953 subaltern officers.—*La France Militaire.*

MEXICO.—M. Branger, writing in the *Armée et Marine*, speaks in strong commendation of the new automatic rifle and carbine, invented by Colonel Mondragon, Military Attaché of Mexico in France. A private test of these weapons was made recently at the Hotchkiss shops at Saint-Denis, at which only the military attachés and notabilities of different Powers represented at Paris were present. Owing to the confidential nature of the trial, M. Branger cannot, he says, enter into details, but the tests were entirely successful, and, without doubt, these new firearms leave far behind all models hitherto tested.

The rifle is of the type employing gas expansion to operate its mechanism, and can be readily transformed into an ordinary repeating rifle if its automatic mechanism becomes disarranged, or if it is desired to economise ammunition. Both rifle and carbine are of 7-mm. calibre, taking the Spanish model Mauser cartridge, with an initial velocity of 680 metres, and a maximum pressure of 3,000 kgs. per square centimetre. The mechanism is in two independent parts, one operating the weapon as an ordinary repeating arm, the other operating it as an automatic arm, of which the fire can be controlled at will. This second mechanism is attached below the barrel, and contains the gas chamber, which communicates with the interior of the barrel by an orifice near the muzzle. The breech of the weapon is original in form and unlike that of any in use.

The weapon is charged with six cartridges at a time, held in double row in a clip, and can be readily operated with accuracy, it is stated, at the rate of about sixty shots a minute. The movement of a small lever, near the muzzle, instantly transforms the weapon into an ordinary repeating arm, capable of being operated at the rate of

from twenty to twenty-five shots a minute. Exteriorly the weapon resembles those already in use. Its weight is 4·1 kgs., which is to be reduced to 3·9 kgs. by a modification soon to be made in the breech mechanism. Aside from certain points inherent in all automatic arms, such as the forcible ejection of a shower of cartridge cases, which might considerably disturb the aim of a firing squadron, it is stated that the new weapon is a marvel of construction, rapidity, accuracy, and solidity, and does honour to its inventor.—*United States Army and Navy Journal.*

PORTUGAL.—The law of July, 1899, re-organising the Portuguese Army (see JOURNAL for December, 1900), introduced important changes into the system of recruiting then in force: other measures of the highest importance, however, have since been brought forward, especially with regard to the re-division of the kingdom, of which it may be as well to give a short account.

According to the terms of the decree of the 7th December, 1901, Portugal will, in future, be divided into three great military districts, viz., the northern, the central, and the southern. The adjacent islands will continue, as before, to form two military commands, that of the Azores, and that of Madeira. Each of the great military districts will consist of two territorial military divisions; each of these, later, will be split up into two brigade districts, and each brigade district into two regimental sub-divisions for recruiting and for the reserves. The military command of the Azores will consist of two such sub-divisions, whilst Madeira will only have one.

Two divisions of the Regular Army will be recruited from, and will be permanently quartered in, the district of each great command. The composition of a division will be as follows: A company of sappers; a field artillery regiment of 6 batteries; a cavalry regiment of 4 squadrons; 2 brigades of infantry of the line of 2 regiments of 3 battalions each. The headquarters of the military territorial divisions will be: for the Great Northern Military District, Porto and Villa Real; for the Central Military District, Vizeu and Coimbra; for the Southern Military District, Lisbon and Evora. The effective command of the military territorial divisions, having their headquarters at Lisbon, Porto, and Vizeu, will be exercised by a general of division; that of the other divisions may be exercised either by a general of division or by a brigadier-general. Cavalry and infantry brigades will be commanded by brigadier-generals of their respective arms, or by colonels whose capacity for the rank of general is recognised. The regimental sub-divisions for recruiting and reserves will be commanded by infantry field officers. These dispositions have been completed by a second decree of the 24th December, 1901, which fixes as follows the future composition of the Portuguese Army:—

Engineers.—The Regular troops of this branch of the Service will be formed into a regiment of 10 companies, viz.: 6 sapper, 2 pontoon, 1 field telegraph, and 1 railway. A section of conductors will be attached to each pontoon, telegraph and railway company. The peace effective of this regiment will be 47 officers and 1,022 men, with a proportionate number of horses and mules. On a war footing the number of the officers will be raised to 65, and that of the men to 2,822. There will, in addition, be three independent companies: 1 of garrison sappers, 1 of torpedo-men, and 1 of garrison telegraphists.

Artillery.—Will consist of 6 field artillery regiments of 6 batteries each; a brigade division of 2 horse artillery batteries; a brigade division of 2 mountain batteries; 6 brigade divisions of garrison artillery of 3 batteries each; and finally 4 independent batteries of garrison artillery. On a peace footing the battery will be made up of 4

guns and of 2 caissons for field, and of 4 guns and 4 caissons for horse artillery. On a war footing each battery will consist of 6 guns, with 9 caissons, 3 battery wagons and 1 forge for field artillery; 6 caissons, 3 battery wagons, 1 forge, and 1 ration and forage wagon for horse artillery; 1 reserve gun carriage, 2 reserve ammunition wagons with 60 boxes, and 1 forge for mountain artillery. The batteries which, on a peace footing, consist respectively of 3 officers and 78 men, of 4 officers and 85 men, and of 3 officers and 74 men, have each on a war footing 5 officers and 159, 187, and 222 men, respectively, with the necessary horses and mules. In peace-time the sixth battery of each field artillery regiment will be armed with howitzers, and the six batteries of a regiment will form 2 brigade divisions of 3 batteries.

Cavalry.—There will be 10 Regular cavalry regiments, which will each consist of 4 squadrons. The peace effective per regiment has been fixed at 519 sabres, which will be raised to 759 in time of war.

Infantry.—The Regular infantry will be made up of:—6 rifle battalions, each consisting of 6 companies on a peace footing to be reduced to 4 companies when mobilised for war; 24 regiments of infantry of the line of 3 battalions of 3 companies each; 3 regiments of infantry of the line of 2 battalions of 3 companies each. The rifle battalions will each have a sapper and a cyclist section attached to them, and further each company will be provided with a machine gun section. The battalion effective is fixed at 27 officers and 498 men, on a peace footing, which will be doubled, both as regards officers and men, for war. The infantry of the line will receive proportionally a greater number of reservists than any other branch of the Service. The peace effective of a regiment of 3 battalions amounts to 38 officers and 567 men; that of a regiment of 2 battalions to 28 officers and 438 men; in the case of the former, in war-time, the effective will amount to 62 officers and 3,012 men, and of the latter to 43 officers and 2,008 men. All the new formations will be made from the 1st July next, according as the resources of the Treasury will permit.

Another decree of the same day, following the one mentioned above, deals with the Reserves. The Portuguese, who have hitherto only been liable to 15 years' service, viz., 3 years with the Colours, 5 years in the 1st and 7 years in the 2nd Reserve, will in the future pass 10 years in addition, from 35 to 45 years of age in a 3rd, called the Territorial Reserve. The decree thus explains the rôle of the different Reserves:—

"The 1st and 2nd Reserves of the Army are meant: (*a*) To complete the effectives of the Army units on a change from a peace to a war footing. (*b*) To make up, in the same units, losses resulting from a campaign. (*c*) To form garrison troops specially meant to occupy strategic and fortified points. (*d*) To form field units, as circumstances demand, for employment in the 2nd line."

"Men of the Territorial Reserve are destined for local defence in proximity to their homes."

Such is, in its general lines, the new organisation of the Portuguese Army. Its chief apparent effect is to increase from 66 to 68 the number of the infantry battalions, and to facilitate the enrolment of men of the 1st Reserve, at the same time insuring a better defensive system for the kingdom. Financial reasons are probably responsible for only giving 3 companies to a battalion, but there is little doubt that a fourth company will before long be added. The organisation of the rifle battalions is an entirely novel one. It will be remarked that instead of increasing, the number of companies is diminished on the change from a peace to a war footing. Two reasons are responsible for this measure. The recruiting for the rifle battalions being carried out throughout the whole kingdom, it would be difficult, on sudden

mobilisation, to assemble in good time a sufficient number of reservists to complete the effective of 6 companies; in addition, the special training that these companies receive do not permit of the attachment of as many reservists to them, as those of the ordinary infantry. It, therefore, appeared preferable to reinforce the effectives of four of the companies by men drawn from the other two, so as to be obliged to draw as few men as possible from the 1st Reserve.

When the new decrees will have come into full force, which will be very shortly, the first line of the Portuguese Army will consist of about 95,000 men. By adding to these the special formation of the 2nd Reserve (65,000 men), and those of the Territorial Reserve (approximately 70,000 men), it will be found that the maximum of the military forces of the kingdom amount to 230,000 men.—*Précis from Revue du Cercle Militaire.*

SWITZERLAND.—The *Revue Militaire Suisse* states that the Swiss autumn manœuvres will take place in the much-indented country lying between Lucerne and Aarau, and bounded on the east by the lakes of Baldegg and Hallwyl, and on the west by the Sempach lake and the river Suhr which flows out of it. On 10th September the 8th Division will assemble east of Sempach and the 4th Division south of Aarau. The troops will not assemble in battalions and then go by rail to their positions as on previous occasions, but they will mobilise in companies and each company will reach its position by marching. These marches will take the place of the exercises which generally precede the manœuvres.

CORRESPONDENCE.

RECRUITING FOR THE ARMY.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—In the *United Service Magazine* for September, 1891, my ideas on the subject of Recruiting for the Army were published.

The requirements then were very different from what they are now, and I worked on the basis that 25,000 recruits annually for infantry alone would be sufficient.

If my proposals had been then adopted, at the commencement of this war we should have had available 168,500 men for foreign service, and 163,000 men for home service, this latter number including all men with less than 3 years' service.

Our actual condition in September, 1899, was far below these numbers.

May I shortly recall those proposals and compare them with Mr. Brodrick's, which are almost identical!

Enlistment.

United Service Magazine	3 years with Colours. 8 years with Reserve.
Mr. Brodrick	3 years with Colours. 9 „ Reserve.

Re-engagement.

U.S. Magazine	After 2 years' service, re-engagement to complete service with Colours.
Mr. Brodrick	After 2 years' service, re-engagement for 6 years with Colours, 7 in Reserve.

U.S. Magazine ... ... { After 11 years' service, re-engagement to complete 21 years' service for a limited number, or for 2nd Reserve.

This chiefly to retain N.C. officers.

Mr. Brodrick ... ... { Apparently after 12 years' service the men are lost for good.

The principles are evidently the same, the details differ slightly. Conscription is not, under present circumstances, suitable or necessary for our Army. If, however, some day we arrive at "One man, one vote," then I think, as a legitimate consequence, as each man is to have an equal share in the Government of the country, so each man must bear an equal liability for its defence.

If the Army of the future is to be a profession, some provision must be made to allow a certain number to make it so, especially non-commissioned officers: therefore, the terms which will enable any recruit to look forward to the chance of a pension require to be known at the time when he enlists. What is it that makes the Irish Constabulary and our own Police so reliable? The great care taken in the orignal selection of the men, and the men's knowledge that once enlisted, with good conduct their future is secure.

With this exception, I am inclined to think that Mr. Brodrick's proposals are the best, as they give a larger Reserve in proportion to the Colour men.

		Pay, etc.	
U.S. Magazine	... ...	The recruit to be an apprentice.	
Mr. Brodrick	... ...	Full pay on becoming an efficient soldier.	
U.S. Magazine	... ...	On re-engagement, after 2 years' service, increased pay.	
Mr. Brodrick	... ...	Ditto.	
U.S. Magazine	... ...	No stoppages for rations, etc.	No deferred pay.
Mr. Brodrick	... ...	Ditto.	Abolished.

Mr. Brodrick is more liberal than I was, but wages have risen considerably in the last ten years.

Under the conditions now proposed by Mr. Brodrick, I feel sure there will be no difficulty in raising the necessary number of men as soon as the facts are well known. The great point to bear in mind is, that there must be no ambiguity about the terms, and they must be adhered to. Years ago it was stated that the soldier was to receive 1s. per day, but he never did. Like everyone else, the soldier expects to be honestly dealt with—not taken advantage of, as was frequently the case in the past.

Mr. Brodrick estimates that he will require 50,000 recruits annually. Let me now show what number of trained soldiers this will eventually provide, without including Militia, Yeomanry, or Volunteers, or aid from the Colonies.

I take the number of 10,000, as then by multiplication by 3, 5, or whatever number is necessary, the result is easily seen, and I allow 10 per cent. for wastage with the Colours and 5 per cent. only with the Reserve. The wastage in the Army used to be about 8 per cent., and I think in the future it ought to be less, but it is safer to give a good margin.

Out of every 10,000 men enlisted, at the end of the second year, there would, therefore, remain 8,100, one-half of whom, say, 4,000 would during the third year of service be eligible to re-engage, the other half, say, also 4,000, would go to the Reserve. So at the end of the third year the numbers would be as follows:—

——	With Colours.	Reserve.
End of 1 year's service	9,000	—
„ 2 years' „	8,100	—
„ 3 „ „	3,600	3,895
Total	20,700	3,895

Or if 8 per cent. only is allowed for wastage the numbers would be :—

	21,444	3,990

At the end of 8 years when the Colour men would attain their maximum the result would be :—

——	With Colours.	Reserve.
Men at end of 1 year's service	9,000	—
„ 2 years' „	8,100	—
„ 3 „ „	3,600	3,895
„ 4 „ „	3,240	3,700
„ 5 „ „	2,916	3,515
„ 6 „ „	2,625	3,340
„ 7 „ „	2,363	3,170
„ 8 „ „	2,127	3,010
Total	33,971	20,630

As, however, 2,127 men who have completed 8 years with the Colours would still have 4 more years to serve in the Reserve, and the 3,010 Reserve have also 4 more years to complete their time, there must be added to the Reserve numbers :—

——	Joining Reserve.	Old Reserve.
9-year men	2,000	2,850
10 „	1,900	2,710
11 „	1,805	2,575
Total	5,705	8,135

The total result of Mr. Brodrick's conditions will, therefore, be that in the eleventh year, and every subsequent year, for every 10,000 recruits enlisted annually there will be available for service :—

With the Colours	33,971
„ Reserve	34,470

Or multiplied by 5 :—

With the Colours	169,855
„ Reserve	172,350

And if to this is added, say, 15,000 for non-commissioned officers and selected men permitted to serve on for pension, we arrive at the number of 185,000 with the Colours of all ranks except officers.

The importance of care in recruiting will be seen by the fact that, if the wastage of men with the Colours is reduced to 8 per cent., 13,500 men will be added to the ranks under Mr. Brodrick's scheme, bumping his numbers with the Colours to nearly 200,000.

With a proper system of reliefs this will allow 130,000 men for India and garrisons abroad, 70,000 men serving at home, which ought to be as many as we require in times of peace.

In times of emergency there would be about 45,000 Reserve men who have only left their regiments within 12 months, and about 40,000 more who have been serving within 2 years, so that little beyond equipment would be required.

I trust I have shown that this system is well fitted for our wants, and that there is no need to think about conscription, for it is evident that, provided the 50,000 recruits are obtainable, by adding or deducting 10, 20, or whatever percentage is necessary, to the numbers permitted to re-engage, the total strength of the Army can be at once increased or diminished.

J. E. HARRIS,
Colonel, Retired Pay,
Late Commanding 2nd Bn. Suffolk Regiment.

NAVAL AND MILITARY CALENDAR.

MARCH, 1902.

1st (Sat.) 3rd Bn. North Staffordshire Regiment (Militia) left England for South Africa on the "Montrose."

" 5th Bn. Middlesex Regiment (Militia) left England for South Africa on the "Roslin Castle."

3rd (M.) 4th Bn. Worcestershire Regiment arrived at Bermuda from England on the "Harlech Castle."

" " A Parliamentary paper was issued showing the number of remounts sent to South Africa during the War.

4th (T.) 6th Bn. Manchester Regiment (Militia) arrived at Cape Town from England on the "Dilwara."

6th (Th.) 3rd Bn. Welsh Regiment (Militia) arrived at Southampton from Cape Town on the "Lake Eric."

" " 4th Bn. West Yorkshire Regiment (Militia) left Cape Town for England on the "Ulstermore."

7th (F.) 3rd Bn. West Yorkshire Regiment (Militia) arrived at Southampton from Malta on the "Sicilian."

" " Lieut.-General Lord Methuen, whilst moving with 1,200 British troops, 5 guns, and a convoy from Vryburg to Lichtenburg, was defeated and captured by General Delarey with 1,500 Boers. The British losses were very heavy.

8th (Sat.) H.M. the King presented medals at Keyham to officers and men for services in South Africa and China.

" " Lord Kitchener reported that a Boer magazine containing 310,000 rounds of small arms ammunition, a Maxim gun, and other stores, had been discovered at Reitz.

10th (M.) H.M.S. "Iphigenia" paid off at Portsmouth.

" " 3rd Bn. South Wales Borderers (Militia)
3rd Bn. East Lancashire Regiment (Militia) } Left South Africa for England on the "Guelph."

" " 3rd Bn. Queen's (West Surrey Regiment) (Militia)
6th Bn. Middlesex Regiment (Militia)
3rd Bn. Royal Munster Fusiliers (Militia) } Left South Africa for England and Ireland on the "Canada."

11th (T.) 3rd Bn. Middlesex Regiment
4th Bn. Yorkshire Regiment (Militia) } Left England for St. Helena and South Africa on the "Assaye."

14th (F.) Lord Kitchener reported that in another drive, between Frankfort and Lindley, 50 Boers were captured.

" " 3rd Bn. Loyal North Lancashire Regiment (Militia) arrived at Southampton from South Africa on the "Gaika."

15th (Sat.) 3rd Bn. Lincolnshire Regiment (Militia)
" " 3rd Bn. East Yorkshire Regiment (Militia) } Left England for South Africa on the "Orient."

17th (M.) The Ministers of the Powers responsible for the Government of Tientsin approved the principle of restoring the control of that town to the Chinese.

" " 1st Bn. Commonwealth Contingent arrived at Durban from Australia on the "Custodian."

18th (T.) H.M.S. "Bulwark" commissioned at Devonport for Mediterranean.

" " Lord Kitchener reported the captures of General Emmett and Commandant Celliers.

" " New Zealand's offer to send 1,000 more mounted men to South Africa was accepted by the British Government.

" " 5th Bn. Middlesex Regiment (Militia) arrived at Cape Town from England on the "Roslin Castle."

19th (W.) An Alliance between France and Russia with regard to China was published.

" " 4th Bn. East Surrey Regiment (Militia)
" " 1 Company Mounted Infantry } Left England for South Africa on the "Sicilian."

20th (Th.) H.M.S. "Amphitrite" paid off at Chatham.

" " 3rd Bn. Norfolk Regiment (Militia) left Cape Town for England on the "Roslin Castle."

21st (F.) H.M.S. "Amphitrite" commissioned at Chatham for China.

" " 3rd Bn. North Staffordshire Regiment (Militia) arrived at Cape Town from England on the "Montrose."

22nd (Sat.) H.M.S. "Philomel" paid off at Devonport.

" " Launch of first-class armoured cruiser "Lancaster" from Elswick Yard.

" " Launch of third-class cruiser "Frauenlob" from Weser Shipbuilding Co.'s Yard at Bremen for German Navy.

23rd (S.) Mr. Schalk Burger, Mr. Reitz, and General Lucas Meyer arrived at Pretoria from Balmoral, in order to open peace negotiations, and, after an interview with Lord Kitchener, proceeded south to confer with Generals Botha, Delarey, De Wet, and Mr. Steyn, accompanied by a British escort.

23rd (S.) 5th Dragoon Guards } Left South Africa for India
„ „ 9th Lancers } on the "Mohawk."

24th (M.) Lord Kitchener reported the discovery of 3 Krupp guns in the Liebenberg Vlei.

„ „ 3rd Bn. King's Own Yorkshire Light Infantry (Militia) left Malta for England on the "Menes."

„ „ 4th Bn. West Yorkshire Regiment (Militia) arrived at Southampton from Cape Town on the "Ulstermore."

„ „ H.M.S. "Irresistible" left Plymouth for Mediterranean.

26th (W.) Lord Kitchener reported that in a drive against Delarey 5 guns and 179 prisoners were captured.

„ „ 3rd Bn. Leicestershire Regiment (Militia) Drafts } Left England for South Africa on the "Britannic."

„ „ H.M.S. "Brisk" paid off at Malta.

„ „ H.M.S. "Aurora" arrived at Plymouth from China.

27th (Th.) The War Office issued an Order regarding Army Reforms.

„ „ 3rd Bn. Middlesex Regiment arrived at St. Helena from England on the "Assaye."

29th (Sat.) Colonel Colenbrander relieved Fort Edward, which had been threatened for some time by Commandant Beyers.

30th (S.) A terrible accident happened to a military train near Barberton, in which 38 men were killed and 45 injured.

„ „ 3rd Bn. Royal Munster Fusiliers (Militia) arrived at Queenstown from South Africa on the "Canada."

31st (M.) Major-General W. Kitchener inflicted a severe defeat on Generals Delarey and Kemp near the Hart River. There were heavy losses on both sides.

„ „ 4th Bn. Yorkshire Regiment (Militia) arrived at Cape Town from England on the "Assaye."

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NAVAL.

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Station Electric Telegraphs." "Blockade and International Law." "Method of Indirect Aiming by Artillery." "The New Provisional Field Manœuvre Regulations for the French Field Artillery." "Russian Fire Regulations for Siege and Fortress Artillery." "The Slaby-Arco Portable Field Apparatus for Wireless Telegraphy" "Schneider Matériel for Field, Mountain, and Position Artillery." "Field Howitzers." "Foreign Military Notes."

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PORTUGAL.—*Revista de Engenheria Militar.* Lisbon: February, March, 1902.—Have not been received.

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February and March, 1902.—Have not been received.

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NOTICES OF BOOKS.

Projets et Tentatives de Débarquement aux Iles Britanniques. Vol. II. Par ÉDOUARD DESBRIÈRE, Capitaine de Cavalerie, breveté à l'État-Major de l'Armée. Paris, 1901.

The second volume[1] of this work, which is in three parts, sustains the interest awakened by the first most successfully, and we sincerely commend it to all unbiased students of our naval and military history.

The first part deals with the expedition of 1798, which comprises, the landing and campaign of Humbert in Ireland; Bompard's abortive attempt to support him ending in the attempted landing in Lough Swilly, the second expedition of Savary, and the grand armament at Brest. The introductory chapter on the military situation in the British Isles brings together a large amount of exceedingly interesting information from reports of spies and travellers, also from old English pamphlets and official papers. It would well reward translation and republication as a special paper for the Institution.

The whole history of Humbert's landing at Killala, his very decided victory at Castlebar and subsequent advance to Ballinamuck within two marches or thereabouts of Dublin, shows very clearly the great danger we then ran but for the extraordinary delays, orders, and counter-orders in the French dockyards. The actual strength of the whole command was only 82 officers and 1,017 men, and there seems no reason why that number should not have been multiplied tenfold with a little better organisation: and the same conjuncture of circumstances which enabled the expedition to reach the coast undetected or disturbed by the British Fleet would have equally favoured the larger force. As for its ultimate retreat, the French were under no delusions on that point, as all expeditions had orders to burn their ships and land their crews if attacked by the British whilst at anchor. They looked forward to decisive action on land only, and seeing what they actually achieved with these small numbers, which rather discouraged

[1] The review of the First Volume of M. Desbrière's work appeared in the JOURNAL for April, 1901.

than invited the wish to rise, it is difficult to set limits to the damage and injury a larger force under the same able leadership might not have occasioned to us.

Savary, the officer in command of the flotilla, was 16 days at sea, and remained off the coast 48 hours, and ultimately regained Bordeaux 16 days later without encountering any British cruisers. That is to say, in spite of all our naval superiority, a French squadron managed to keep the sea for 34 days, from the 6th August to 9th September, without our succeeding in finding it. When Humbert sailed it had been intended that he should be immediately supported. The causes that led to the delay are contained in Chap. VI., and deserve close attention.

Ultimately, Admiral Bompard succeeded in getting away from Brest on the 18th September, but being chased by three British vessels, had to make a long detour out into the Atlantic, which prolonged his voyage to the 10th October, but this time our fleet was duly warned, and on the look-out, and he was defeated off Lough Swilly, and compelled to run for shelter, and only three vessels out of nine succeeded in regaining Brest on the 20th and 21st October.

Meanwhile, Savary had again prepared for sea, and embarked another small expedition of 1,090 men under command of General Hardy on four frigates, which sailed on the 12th October still in ignorance of Humbert's fate. They reached Killala Bay, 27th October, without incident, but learning the true state of affairs and their dangers, both by land and water, they cut their cables, and made sail, pursued by the British, from whom they only escaped after having thrown overboard most of their guns and stores and even the military chest containing 100,000 francs. One frigate, the "Franchise," went ashore on the Point d'Aiguillon. This expedition at least shows that it was not impossible for reinforcements to reach Ireland, whatever the fate of the ships might be after disembarking them; but this was part of the original scheme, the risk of which had been taken into account when Humbert's first expedition had been planned. Altogether, during 1798 the Directory had arranged seven expeditions, of which five actually took the sea: two, Bompard's and two Dutch frigates, failed completely, and three at least reached the Irish coast unmolested.

The years 1799 and 1800 form the subject of the second part, which is mainly a record of orders, counter-orders, and disorder. The brains were there to plan and the will to strike was strong, but the central power to organise was lacking, otherwise profiting by previous experiences, we might have had to face more serious troubles. The project submitted by Humbert after his exchange in particular deserves attention, as do those of Generals Dupont and Théorneau, the latter of whom advocated with considerable topographical knowledge a raid on the Medway and Thames and the destruction of all the shipping in the Port of London.

The third part covers the period from the formation of the Neutral League, 19th December, 1800, and up to the Peace of Amiens on 27th March, 1802. On the 27th January, 1801, Bonaparte addressed a letter to Talleyrand pointing out that peace having been made on the Continent, ample land forces were available either against Ireland, Brazil, and the Indies, against the West Indies, or in the Mediterranean.

Armies were to be formed in Holland, Brest, Bordeaux, Cette, and Marseilles; and Spain was to be approached with a view of obtaining the loan of her 15 vessels then lying in Brest. Other projects then engaged the attention of the First Consul, and it does not appear that any definite settled plan was ever drafted and agreed to; but presently the idea of developing the Boulogne flotilla was put in hand, and the rest of the book deals at length with the arrangements made along the Channel coast and in Holland with that object, and our efforts to interfere with them.

That these preparations were not conducted with the single-minded concentration of purpose which usually characterised the First Consul in the execution of his designs we are quite prepared to acknowledge, but that millions were spent over a term of years without definite aim in view is more than we can concede, and the fact that no search has revealed this concrete plan cannot in itself be taken as evidence that he did not cherish the design, had want of vigilance on our part afforded him a practicable opening. Given the troops and the boats in their proper places, together with the opportunity, the choice of his objective would soon have been made, and it would certainly have been at variance with all sound principles of warfare and of common sense, either to frame plans for all circumstances or to select one circumstance which might not have coincided with his opportunity. There were spies enough in France as well as in England, and any such document would not long have remained secret.

Fortunately our vigilance was not relaxed, and once Nelson was in charge of the Channel Fleet and resources, the French were completely held in check.

M. Desbrière minimises the results of our efforts very considerably, but hardly seems to grasp the idea that it was no good taking our ships into close ranges in shallow waters as long as we could make reasonably certain of finding deep water in which to meet the flotilla if it put to sea.

Though we owe M. Desbrière all thanks for the mass of most interesting documentary evidence he has rendered accessible, we can hardly congratulate him on his editorial skill or thoroughness; the text is loosely put together, and seems to bear very often but slight connection with the evidence, and the revision of the proofs has been little short of scandalous. The French always are rather careless about the spelling of proper names, but in this volume the blunders transgress all bounds, and often with the maps and charts of that date at hand it is impossible to identify the places referred to—rather a serious imperfection in a military study. Thus: "Yarland," presumably "Yantlet"; "Forêt de Hesnault," for "Hainault"; "Adessbroost," undiscoverable: "la ville de Cliff," for the little village of that name—all these occur in two pages of a translation from an English original; and what is to be made of the following in a translation of a letter from Cornwallis to the Duke of Portland: *L'annonce de la défaite de Burgayne à Saratozza?*

PRINCIPAL ADDITIONS TO LIBRARY DURING MARCH, 1902.

Episoden aus den Kämpfen der K. K. Truppen im Jahre 1882, mit Bewilligung und Unterstützung des K. K. Reichs-Kriegs-Ministeriums. By KARL KANDELSDORFER. 8vo. Vienna, 1884.

Seventy-one Days' Camping in Morocco. By Lady GROVE. 8vo. London, 1902.

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Studies in Map-Reading and Field-Sketching. By Lieut.-Colonel WILKINSON SHAW. 6s. Crown 8vo. London, 1902.

The Pilot's Handbook for the English Channel. By Staff Commander J. W. KING, R.N. 13th Edition, revised to present date by Commander T. A. HULL, R.N. 8vo. London, 1898.

The Story of the Khedivate. By EDWARD DICEY. 16s. 8vo. London, 1902.

La Campagne de 1805 en Allemagne. By P. C. ALOMBERT and J. COLIN. Publié sous la Direction de la Section Historique de l'État-Major de l'Armée. Tome I. 8vo. Paris, 1902.

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Field Artillery Training. Official. Demy 12mo. London, 1902.

The Fight with France for North America. By A. G. BRADLEY. 6s. 8vo. London. 1902.

Geschichte des Russisch-Türkischen Krieges 1877-78 auf der Balkan Halbinsel. 1st Part. Herausgegeben von der Kaiserlich Russischen Kriegsgeschichtlichen Kommission des Hauptstabes. Deutsche autorisirte Bearbeitung von Krahmer, Generalmajor z. D. 8vo. Berlin, 1902.

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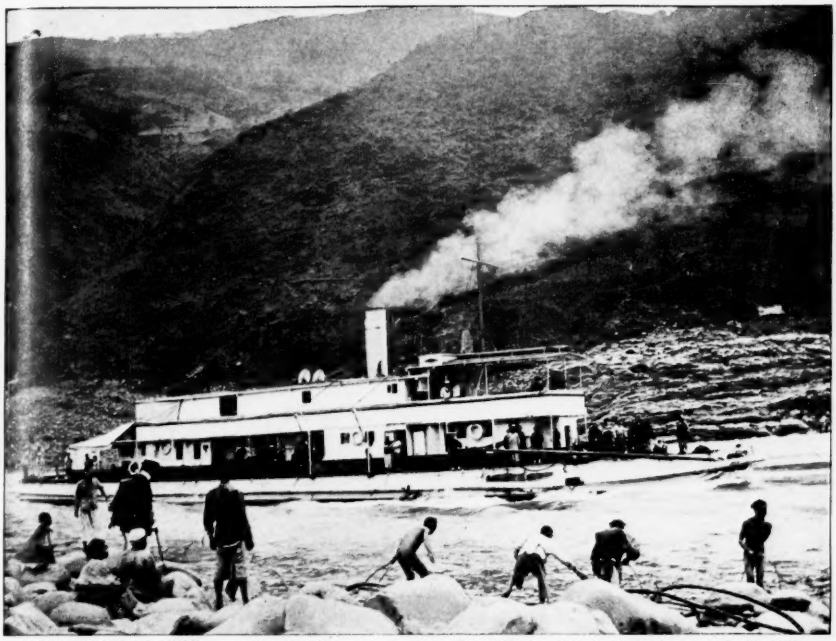
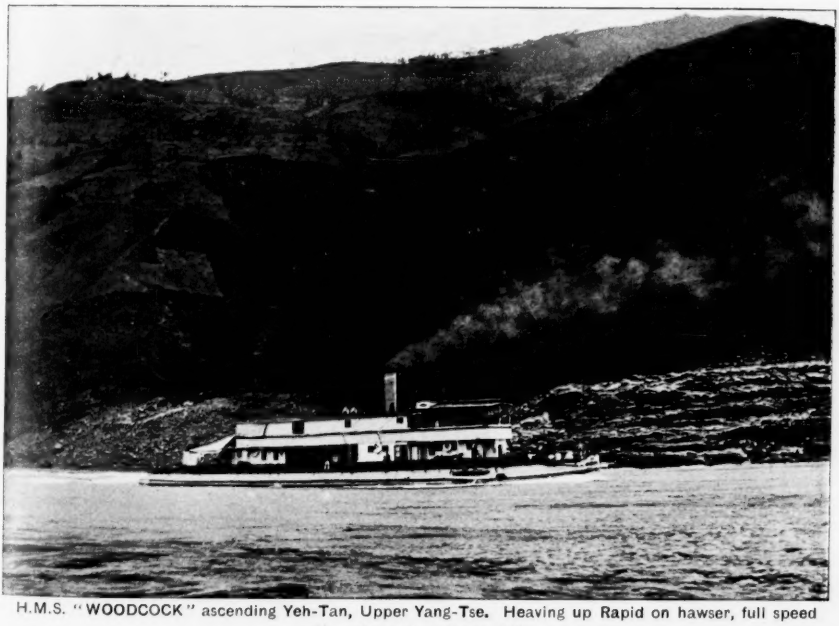
Moltke's Projects for the Campaign of 1866 against Austria. By SPENSER WILKINSON. Official. 8vo. London, 1902.



H.M.S. "WOODCOCK" ascending Yeh-Tan, Upper Yang-Tse. Closing into bank for hawser, April, 1901.



H.M.S. "WOODCOCK" ascending Yeh-Tan, Upper Yang-Tse. Heaving up Rapid on hawser, full speed with main engine, April, 1901.

(*For Description, see Naval Notes, p. 684.*)

J. J. K. & Co., Ltd., London.

ERRATUM.—April Journal.

Page 560, Line 11.—For "*March*" read "*April.*"

LECTURE NOTICE.

June 6th. (Friday.)—"Are 12-in. Guns in Battle-ships the best value for the weight entailed?" By FRED T. JANE, Author of "All the World's Fighting Ships," etc. Admiral Sir JOHN O. HOPKINS, G.C.B., in the Chair. 3 p.m.